CITY OF LOVELAND
FIRE AND RESCUE DEPARTMENT
410 E. Fifth Street • Loveland, Colorado 80537
(970) 962-2471 • FAX (970) 962-2912 • TDD (970) 663-5144

WATER SUPPLY OPERATIONS – RURAL (1.1)

Developed by Engineer Ben Wynkoop, Lieutenant Randy Stuart, and Firefighter Alex Klinger
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- NFPA – 1142 Standard on Water Supplies for Suburban and Rural Fire Fighting.

TASK SKILL DESCRIPTION AND DETAIL

Having a consistent water supply in place is essential to support any fire ground operation. In a rural setting a municipal water supply system is rarely in place. This can make a sustainable water supply very challenging. With no hydrants being available, one tactic firefighters will use is the setup of a drafting operation at the attack engine utilizing one or more port-a-tanks. These will in turn be supplied by water tenders in a water shuttle operation (a.k.a. – tender shuttle or tanker shuttle) that will be shuttling water to and from a designated fill site that is near a static water source (i.e. lake or river) or a hydrant that is a few miles away.

In a water shuttle operation there will be two designated "sites" that need to be determined.

1) **Dump Site** - The dump site will be in the area of where the fire operation will commence. This is where the attack engine will be positioned and the port-a-tank operation will be set up.
2) **Fill Site** – The fill site will be located at the closest water source. In the rural area, the closest water source may be a static one. The word "static" can be defined as non-pressurized. When a hydrant is not available we will turn to a static water source such as a lake or pond to supply water for the operation. If this is the case you will need a dedicated engine or water tender to set up a drafting operation at the fill site to support the tender shuttle.

Water shuttle operations will be apparatus and personnel intensive. There will also be a large amount of radio traffic taking place; therefore, it is imperative for you to request the following:

1) **A dedicated water supply officer** – This position should be held by an engineer or an officer. The person holding this position will be responsible for coordinating the entire water shuttle operation. They will be the one communicating with the attack engine operator as well as command to ensure the water supply needs are being met.

2) **A separate radio channel** – Requesting a separate radio channel for the water shuttle operation will ensure that the main operating channel is not overwhelmed with radio traffic.

Tasks 1 & 2 will describe the tools and appliances needed and demonstrate the task of setting up a single port-a-tank operation as well as a double port-a-tank (aka – double diamond) operation that will provide the water supply to the attack engine in a rural setting.

Task # 1 – Set up for a single port-a- tank drafting operation at the dump site.

Step # 1 – Locate all of the tools and appliances needed to complete the set up.

The tools and appliances you will need for the operation include:

1) One to two sections of 2 ½" or 5" hard suction hose.
2) 2 ½" or 5" low level strainer.
3) One port-a-tank. Note: Removal of the port-a-tank is a *minimum* two person operation.
4) One basketball – The purpose of the basketball is not to have something to play with when we are bored. Its purpose is to float in the port-a-tank and keep air from being introduced into the low level strainer when a venturi event occurs.

For the purpose of this manual we will be using the 5" appliances.

Step # 2 – Connect the low level strainer to the hard suction hose.

Step # 3 – Connect the hard suction hose to the intake on the driver's side of the pump panel.

Make certain the connections are tight. If they are not secured tightly, air will be introduced into the system and in turn will disrupt the drafting process. Your end result will look like the picture below.

Step # 4 – Set up the port-a-tank

Set the port-a-tank on the ground. With a firefighter gripping each of the unhinged sides, simply walk backwards and the port-a-tank will expand. Attempt to open the port-a-tank up as best as you can by pulling the liner out to the edges of the frame.

Step # 5 – Positioning the port-a-tank for operation

When positioning the port-a-tank for operation, there are a few things you will want to keep in mind:

1) Position the port-a-tank on as level a surface as possible.
2) Set the port-a-tank up at 45 degree angle to the pump panel.
3) If you are on a slope, position one of the drain chutes on the downward slope.

(Continued on next page)

4) Position the port-a-tanks in a position so they will be easily accessible to the water tenders supporting the operation. When setting up this is the most important thing to keep in mind. As you can see in the photo below the port-a-tanks are set up to give multiple points of access for tenders.

Step # 6 – Off-loading of water from a tender into the port-a-tank

The water supply officer, or someone who has been designated by them, will be the one directing the water tenders into place at the dump site.

The operator will have controls inside the cab for operating the chutes and will usually be the ones who will control this process. If not, there are controls on the outside of the apparatus as well.

Task # 2 – Setting up the double diamond for operation

For this operation you will follow the same steps as in Task 1 but now you will be adding a second port-a-tank as well as setting up a jet siphon operation. Additional tools and appliances needed for the double diamond include:

1) A second port-a-tank.
2) A second low level strainer.
3) A second 10’- 5”section of hard suction.
4) At least one section of 1 ¾” hose.
5) A second basketball.
6) Two straps or pieces of webbing.

Step #1 – Set up the second port-a-tank

For this operation set up the second port-a-tank at the corner of the first port-a-tank as seen above.
Note: You are not limited to the double diamond set up for drafting operations. You can also set up the port-a-tanks side by side if it means better access for the tenders off-loading water.

Step #2 – Set up jet siphon

Connect the 1 ¾" hose to a discharge on the engine and then connect it to the low level strainer. Once the connection is made you will then attach the second piece of 5" hard suction to the low level strainer.

Step #3 – Set the second piece of hard suction into the second port-a-tank

When setting the second piece of hard suction, the side with the low level strainer should be placed in the second port-a-tank and the other half of the hard suction should be placed in the first port-a-tank.

Step # 4 – Tie off the hard suction and the 1 ¾" hose lines

Be sure to tie both of these hose lines down. These are tied down because this part of the system will be charged and this will prevent them from moving out of place and possibly injuring someone.

Step # 5 – Charge the jet siphon system

Once everything is set up and there is water in the second port-a-tank you can now charge the jet siphon system. This will be done by the engineer charging the 1 ¾" line. This should be charged to 50 psi.

Now that you have learned how to set up and run operations at the dump site we will now describe and demonstrate how to set up and run a fill site. The fill site you choose should be the closest suitable water source. The reason the word "suitable" is used is due to the fact that the closest water source may have some problems associated with it. Some problems you could run into are:

1) Traffic issues or unsuitable road conditions.
2) Water flow requirements
3) Access to the water source (can the fill site engine position close enough)
4) Can other apparatus position and maneuver around easily within the site.

As discussed earlier, when choosing a fill site you will have two choices: Either a hydrant or a static water source. NFPA 1901 recommends that tenders be filled at the rate of 1,000 GPM so keep this in mind when choosing a fill site.

If you choose a hydrant as your fill site:

As far as hooking up to a hydrant you can follow the instructions that you have seen in the municipal water supply portion of the training manual. With using the hydrant as a fill site however there will be a few items you will need to know.

1) Make sure there will be plenty of room for apparatus to maneuver.
2) Make sure you use 5" hose when filling apparatus to cut down on the fill time.
3) Connect a 2 ½" gate valve to the hydrant in order to quickly relieve pressure when filling is complete. As pictured below.
4) If there is not a dedicated engine at the hydrant fill site, all tools and appliances needed for the fill operation may be left in place. This will save time as each tender will not have to set up the system each time.

If you choose a static water source for your fill site:

When a static water source has been chosen you will need to dedicate an engine to the fill site operation. Once that engine has set up a draft, it will stay there for the remainder of the incident. Task # 3 will describe and demonstrate how to set up a drafting operation at a fill site.

Task # 3 – Set up a drafting operation at a fill site

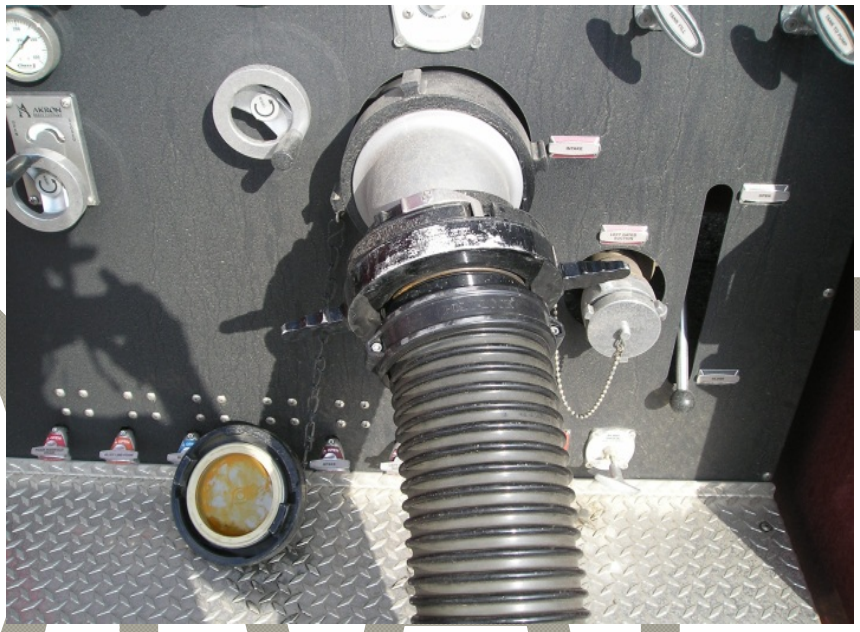
Step # 1 – Locate tools and appliances needed for operation

1) 10' – 20' of hard suction hose.
2) Barrel strainer.
3) Attic ladder or roof ladder.

Step # 2 – Connect the barrel strainer to the hard suction hose

When making the connection, insure the connection is tight. The barrel strainer will prevent any debris from being introduced into the pump.

Step # 3 – Connect hard suction hose to the intake



Once this step is complete there is one thing you can do to assist the engineer. You can check to make sure that all drains on the pump panel are in the closed position. As mentioned earlier, if air is introduced into the system, the draft will be disrupted and the engineer will have to spend valuable time regaining the draft.

Step # 4 – Place a ladder in the static water source

Placing a ladder in the static water source will ensure two things:

1) The ladder will prevent the barrel strainer from falling to the bottom of your static source keeping any unnecessary debris that could slip by the strainer out of the pump.
2) Most importantly though, this will ensure that there will be 24” of water space around the strainer, which is optimum when using a barrel strainer for drafting.

Step # 5 – Drop in the hard suction hose in the water

Once this is done, the engineer will be the one actually obtaining the draft. Your water supply is now limited to the size of your static water source and size of the apparatus pump.

Step # 6 – Connecting the 5” hose for the fill operation

- Choose a 5” piece of hose to insure maximum fill rate.
- Connect the 5” fill hose to a discharge on the fill engine.
- Connect the other end to an intake on the tender needing filled and open the valve.
- Signal the engineer that the fill operation can commence.
- Once the tank is full you can close the valve on the tender and disconnect the hose.

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REFERENCE INFORMATION

The following material was used for reference:

- NFPA 1142 – Standard on Water Supplies for Urban and Rural Fire Fighting.
- IFSTA Pumping Apparatus Driver/Operator Handbook, First edition 1999
- Jones and Bartlett Publishers, IAFC and NFPA Fundamentals of Fire Fighting Skills First Edition 2004.