



Portable Pump Flow Tests

Farmington, Maine
October 9, 2011

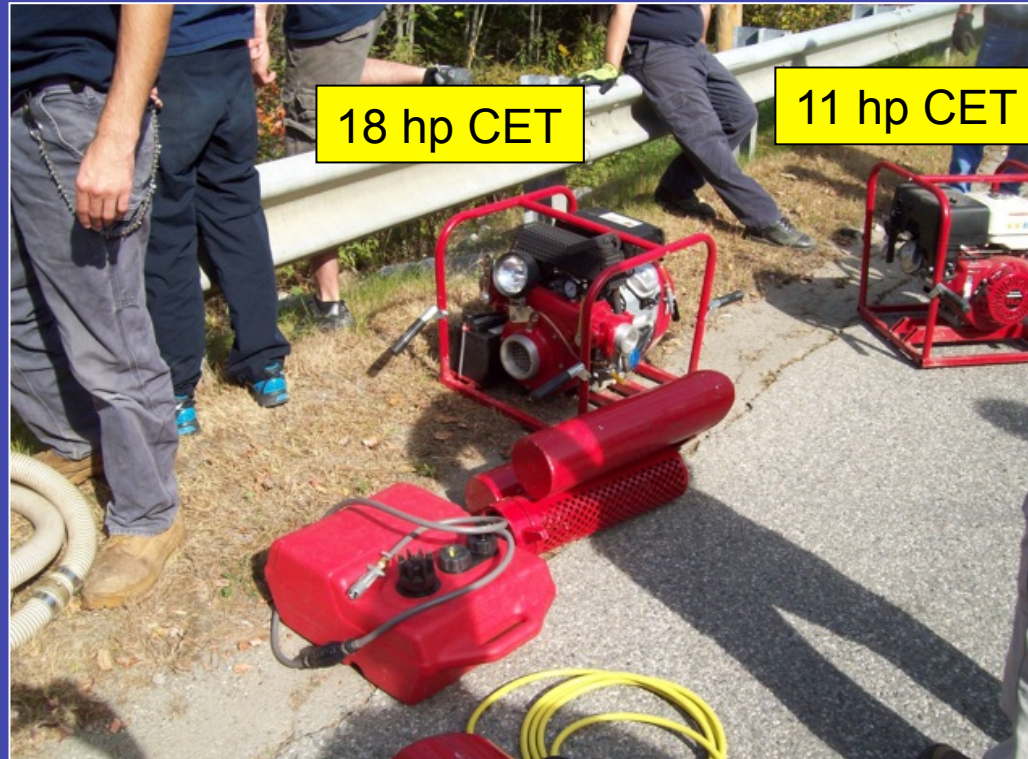
Overview

- On October 9, 2011, GBW Associates, LLC conducted a Rural Water Supply Operations Seminar hosted by the Franklin County (Maine) Fireman's Association and the Farmington Fire Department.
- The seminar focused on the use of LDH and relay pumping operations.
- A couple of the participating departments had portable fire pumps and some discussion occurred regarding the flow capability of the pumps if LDH was used.
- So...a few flow tests were conducted on two of the pumps to compare the use of 2-1/2", 4" and 5" hose as the discharge hose.

The Process

- The flow tests were quite simple: each portable pump was positioned to draft from a brook that provided an adequate water supply for the testing.
- Each pump used two, 10-ft lengths of suction hose and a strainer.
- Each pump had to overcome the same lift and elevation.
- Three flow tests were done on each pump: the pump had to run at maximum throttle and supply water through a 100-ft section of 3-inch hose, a 100-ft section of 4-inch hose, and then a 100-ft section of 5-inch hose.
- A Hose Monster fixed-pitot diffuser device was used to accurately measure the flow.

Test Pumps



Both pumps were made by CET – a popular manufacturer of portable pumps. The FDs could not verify the rated capacity of the pumps, so the test could only rely on the horsepower rating of the motor for comparison.

Test Set-up



The pumps were deployed down over an embankment to a stream where they were set up for operation.

Test Set-up



The 18 hp pump was tested first and used 4-inch suction hose and a floating strainer.

Test Set-up



The 11 hp pump was tested second and used 3-inch suction hose and a barrel strainer.

Test Set-up



The pumps had about 10-ft of elevation to overcome and a lift of less than 4-feet.

Flow Measurement



A Hose Monster flow diffuser was used to accurately measure the flow. The device has a fixed-pitot that allows for accurate pressure readings on the fixed orifice.

Flow Measurement



When flow is measured, a pressure reading on the gauge is converted to a flow using a conversion chart.

2-1/2-inch Hose Test



The 2-1/2-inch hose provided the least amount of flow in both tests.

4-inch Hose Test



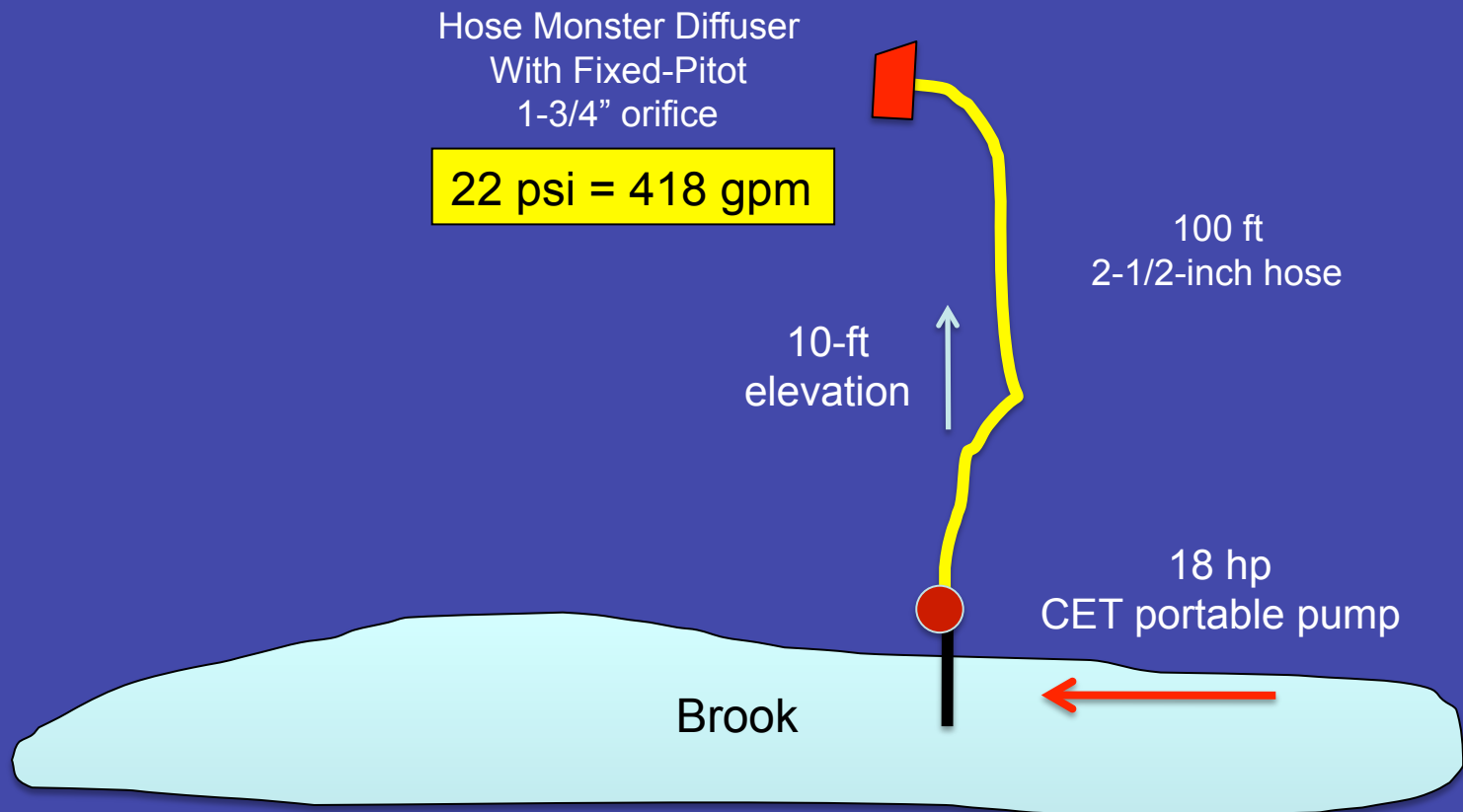
The 4-inch hose provided a marked improvement over the 2-1/2-inch hose in both tests.

5-inch Hose Test

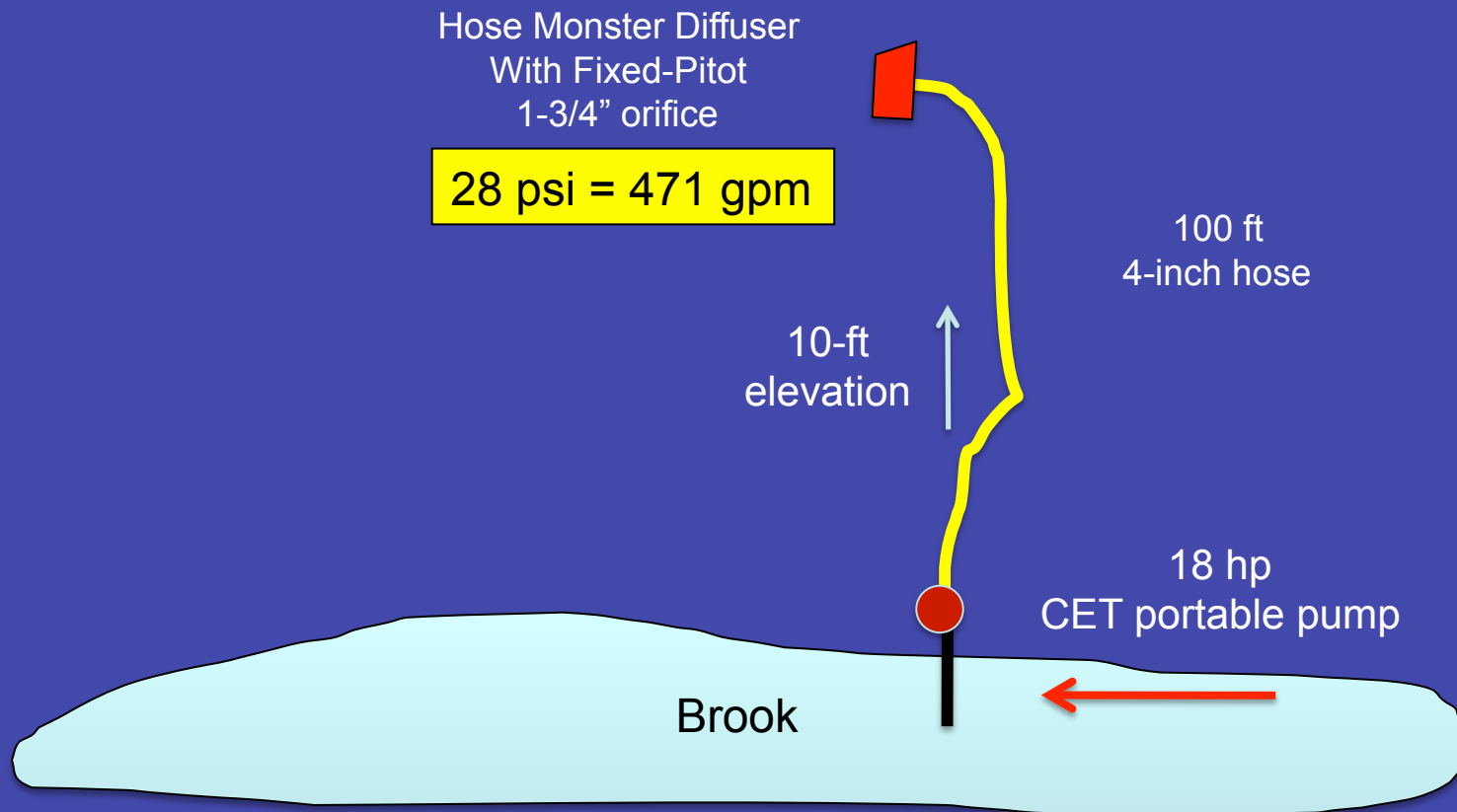


The 5-inch hose provided some improved flow on the 18 hp pump but was not much different from the 4-inch hose during the 11 hp pump test.

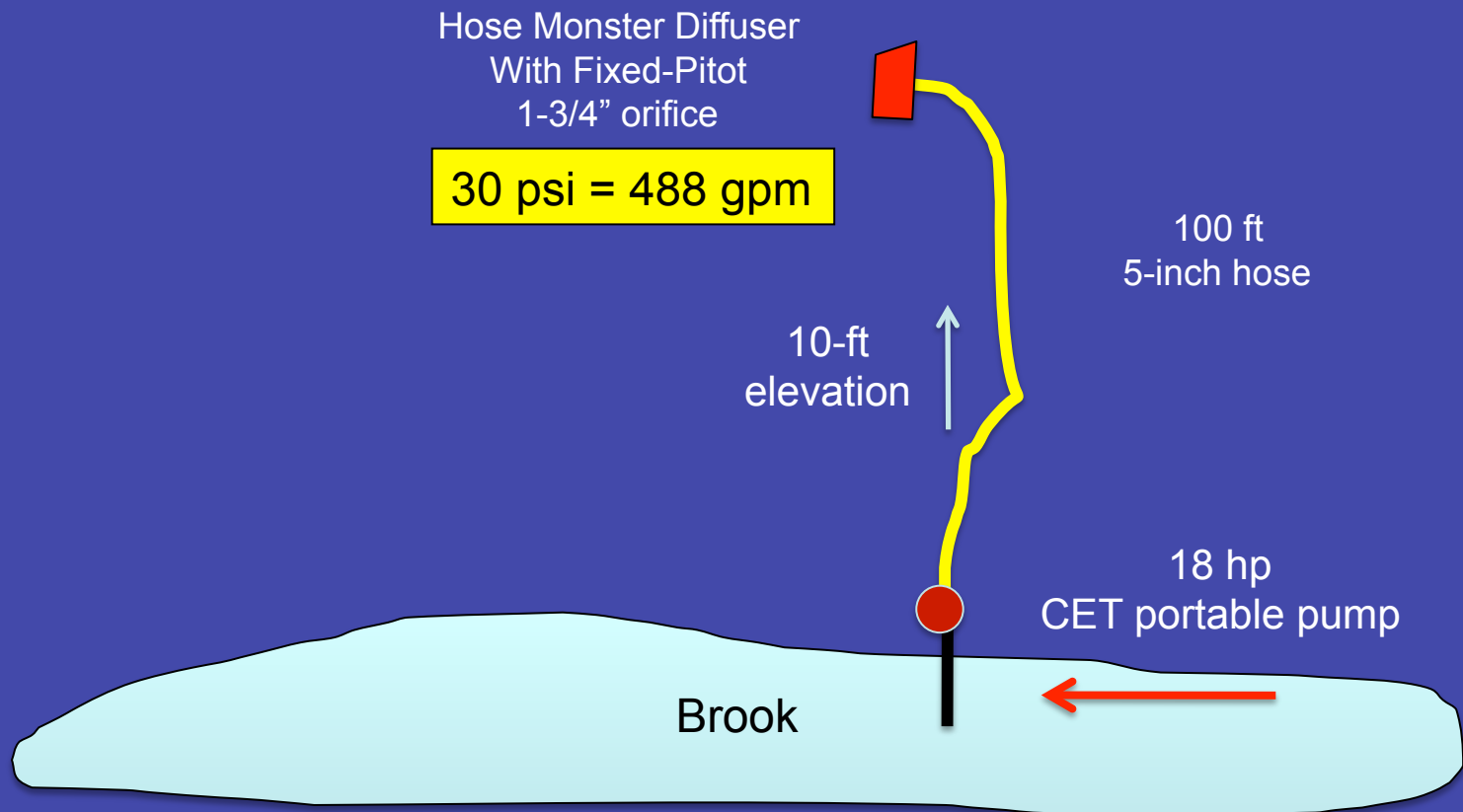
Flow Test 1-1: The Results



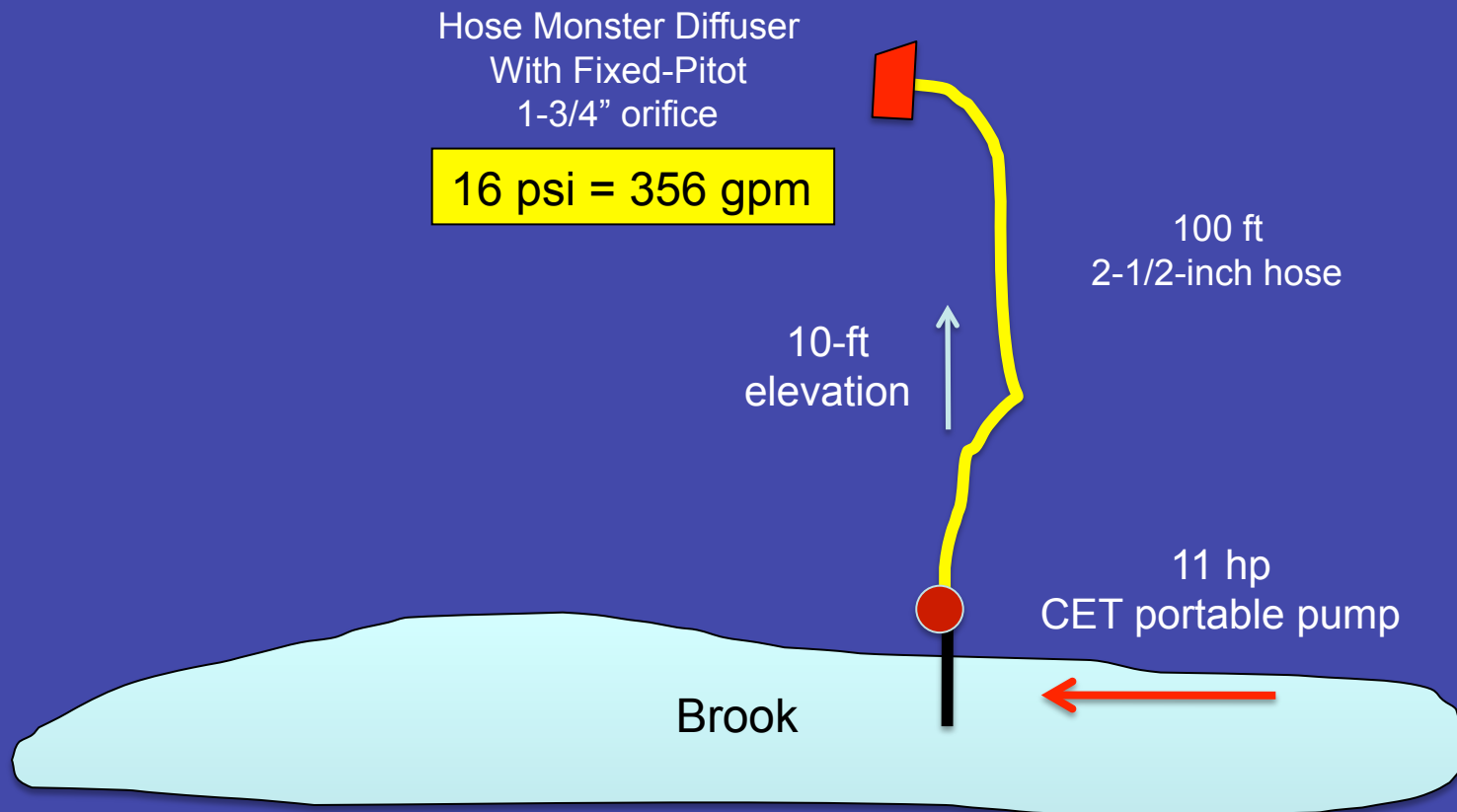
Flow Test 1-2: The Results



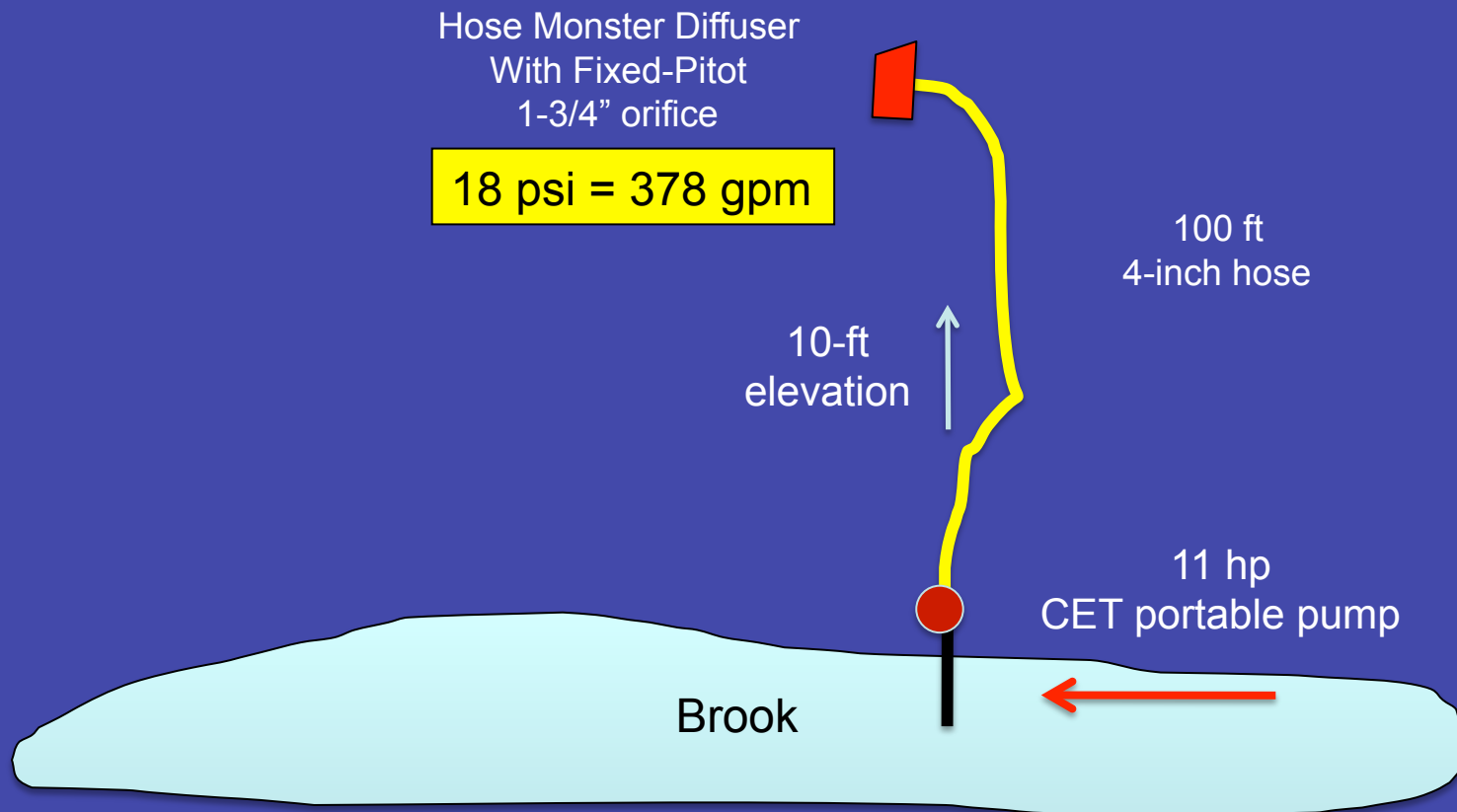
Flow Test 1-3: The Results



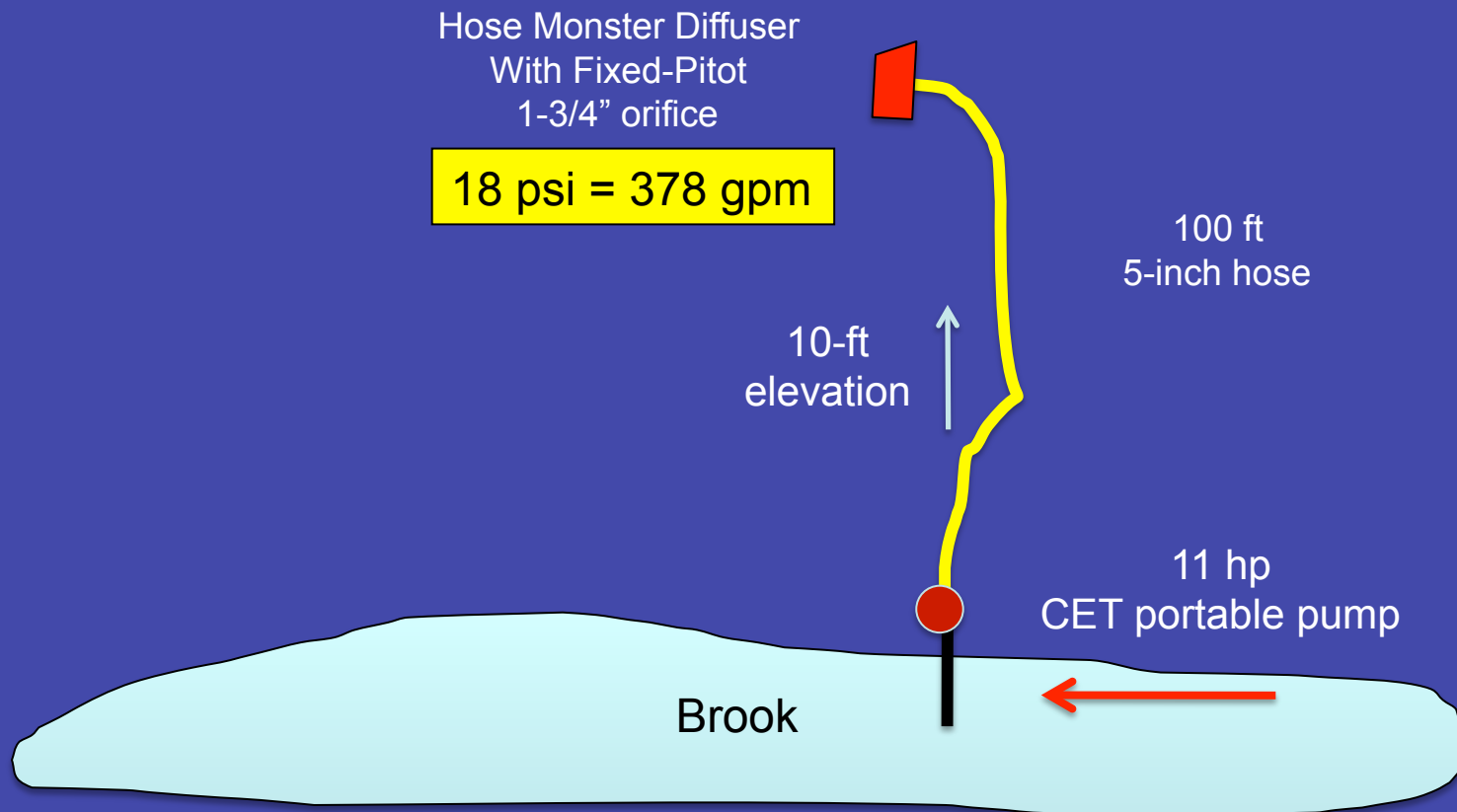
Flow Test 2-1: The Results



Flow Test 2-2: The Results



Flow Test 2-3: The Results



The Results

CET 18.0 hp Portable Pump

Hose	Pitot Pressure	Flow
100 ft of 2-1/2"	22 psi	418 gpm
100 ft of 4"	28 psi	471 gpm
100 ft of 5"	30 psi	488 gpm

The Results

CET 11.0 hp Portable Pump

Hose	Pitot Pressure	Flow
100 ft of 2-1/2"	16 psi	356 gpm
100 ft of 4"	18 psi	378 gpm
100 ft of 5"	18 psi	378 gpm

The Results

- The flow tests illustrated a couple of important points.
- First – the use of LDH clearly has an advantage in many applications – including portable pump operations. In each test, the 4-inch hose increased the flow capability of the pump when compared to using 2-1/2-inch hose.
- Second – all pumps have performance limits. In these tests, the 11 hp reached its peak performance when using the 4-inch hose because the change to 5-inch hose resulted in no change in flow. Thus, the pump capacity was maximized for that set-up.

The Results

- Third, portable pumps are a valuable tool for FDs that have surface water to which they cannot get a fire truck near - but can position a portable pump effectively.
- Finally, portable pump owners should know the practical limits of their portable pumps so that when setting up a water supply operation they know the ability to meet the fire flow demand.

Summary

- The flow tests reaffirmed the importance of using LDH in most all pumping applications
- We thank the folks from Franklin County for participating in the tests.



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