



BESST INC.

**GLOBAL SUBSURFACE
TECHNOLOGIES**



Products and Services



BESST Inc. is the leader in advanced systems for the environmental and water resources industries around the world. We provide a comprehensive range of subsurface monitoring and sampling technologies and services:

- **HydroBooster Pump Services**
 - Low-Flow Purging and Sampling in Wells of Every Depth and Diameter
- **Purging and Sampling Westbay™ Well Services**
 - Significantly Augmented Westbay™ Well Services (SAWBS)
- **Water Supply Well Diagnostic Services**
 - Flow Velocity Profiling and Contamination Location Identification in Groundwater Production Wells Using HydroBooster and DyeTracer Systems



HydroBooster Services

BESST HydroBooster services provide **the most effective low-flow purging capabilities available in the industry.** HydroBooster systems are permanently installed in monitoring wells with or without packers, or deployed in temporary installations for large purge volume requirements.



Permanently-installed HydroBooster systems with Fiber Optic Sensors for continuous data logging, and automated timers, are powered by **solar panels in remote locations for long-term projects.**

The typical HydroBooster purge rate is between **20 and 40 liters per hour.**



Purging and Sampling Westbay™ Well Services

The HydroBooster is used for sampling in all monitoring wells, including in Westbay™ wells as the Significantly Augmented Westbay™ System (SAWBS) to enhance purging and sampling capabilities. SAWBS quickly and effectively removes old, non-representative water from Westbay™ wells and draws in fresh formation water for sampling.

SAWBS may be operated with timer control units, allowing for automated “**walk-away**” operation. The typical HydroBooster purge rate is between 20 and 40 liters per hour.



SAWBS is deployed within MP38 and MP55 wells with excellent results. In mid 2005 12,000 liters of water were purged from 4 MP38 wells for contaminant testing.



Perchlorate resin column (right) and helium isotope sampling require large sample volumes and are conducted using SAWBS.



Water Supply Well Diagnostic Services

DyeTracer / HydroBooster Services



BESST DyeTracer / HydroBooster services provide **large cost savings to municipal, industrial and agricultural water producers** through flow velocity profiling and contaminant source location. Water quality and well performance is diagnosed on an ongoing basis through **BESST Predictive Maintenance programs**, without removing the pump or disrupting water production service. BESST's narrow-diameter pumps (less than 1 inch) can access almost any well through existing ports, or newly developed ports. Diagnostic services are performed under dynamic operating conditions for accurate characterization of actual well performance.



The HydroBooster system is used to pinpoint the location and concentration of contaminants within the well. Samples are drawn at intervals along the production screen.

Water Supply Well Diagnostic Services

DyeTracer / HydroBooster Services (continued)

The DyeTracer system is operated under exclusive license to BESST Inc. Results of DyeTracer flow velocity analysis are comparable to spinner log or other flow measuring methods. Minute amounts of rhodamine dye (EPA and NSF Standard 60 approved) are injected at intervals along the well screen corresponding with sample locations. The return rate of dye to the surface is measured for precise flow velocity profiling.



The DyeTracer system is used to inject dye at intervals along the well screen.



The fluorometer detects the return concentrations of the dye in PPB.



Return rate data are continuously logged on a computer.

Water Supply Well Diagnostic Services

DyeTracer / HydroBooster Services (continued)

Well Economics – Case Study

The five vessels in the adjacent picture each contain 22,000 lbs. of carbon. About every 20 days, the carbon becomes surface-loaded with hydrocarbon contaminants, resulting in contaminant breakthrough. On each occasion, the water purveyor spends \$50,000 to replace the surface-loaded carbon. The annual carbon cost is \$912,500 not including staff resources provided by the water purveyor.

The BESST HydroBooster system pinpointed the main zone of contamination within the well. Then the water production profile data generated by the DyeTracer system was overlaid on top of the contaminant distribution data.



\$912,500 / yr. for Carbon Replacement



\$100,000 per yr. for carbon replacement after using BESST well diagnostics to evaluate water quality and performance



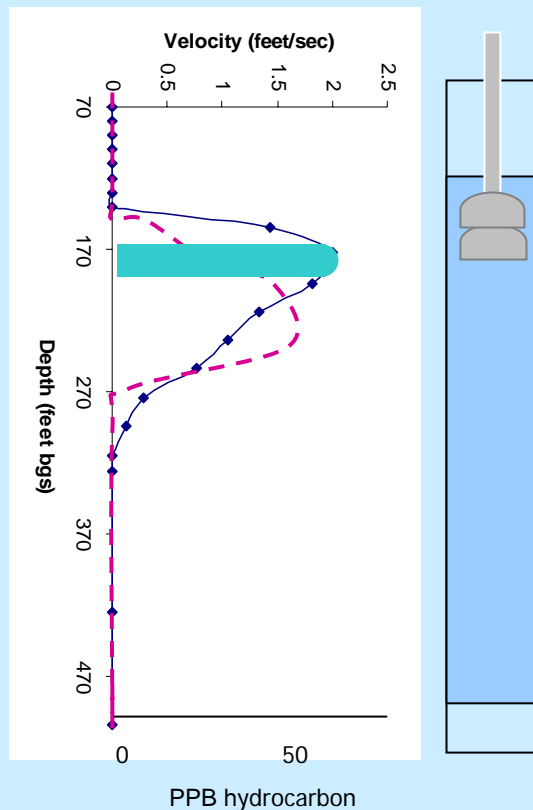
The combined sampling and flow velocity data revealed a high-producing, low-contamination zone. The water purveyor determined that the pump could be moved to a clean zone in the well, reducing carbon replacement to twice per year. The resulting cost savings in carbon is estimated at \$812,500 per year.

The next slide shows an example of flow velocity profile and contaminant distribution data.

Water Supply Well Diagnostic Services

DyeTracer / HydroBooster Services (continued)

Example Calculation For Converting Flow Velocity Profile To GPM



DATA

- Flow Meter = 1,500 GPM
- Flow velocity at 170 ft. BGS = 50 seconds (as determined by peak return time for rhodamine dye to fluorometer).
- Flow velocity at 190 ft. BGS = 64 seconds (as determined by peak return time for rhodamine dye to fluorometer)
- [Cross section area of well] x [distance between sampling points (20 feet)] = 209 gallons.

CALCULATION

$$209 \text{ GPM} / (14 \text{ Secs}/60 \text{ Secs}) =$$

$$209 \text{ GPM} / 0.23 = 908.6 \text{ GPM}$$

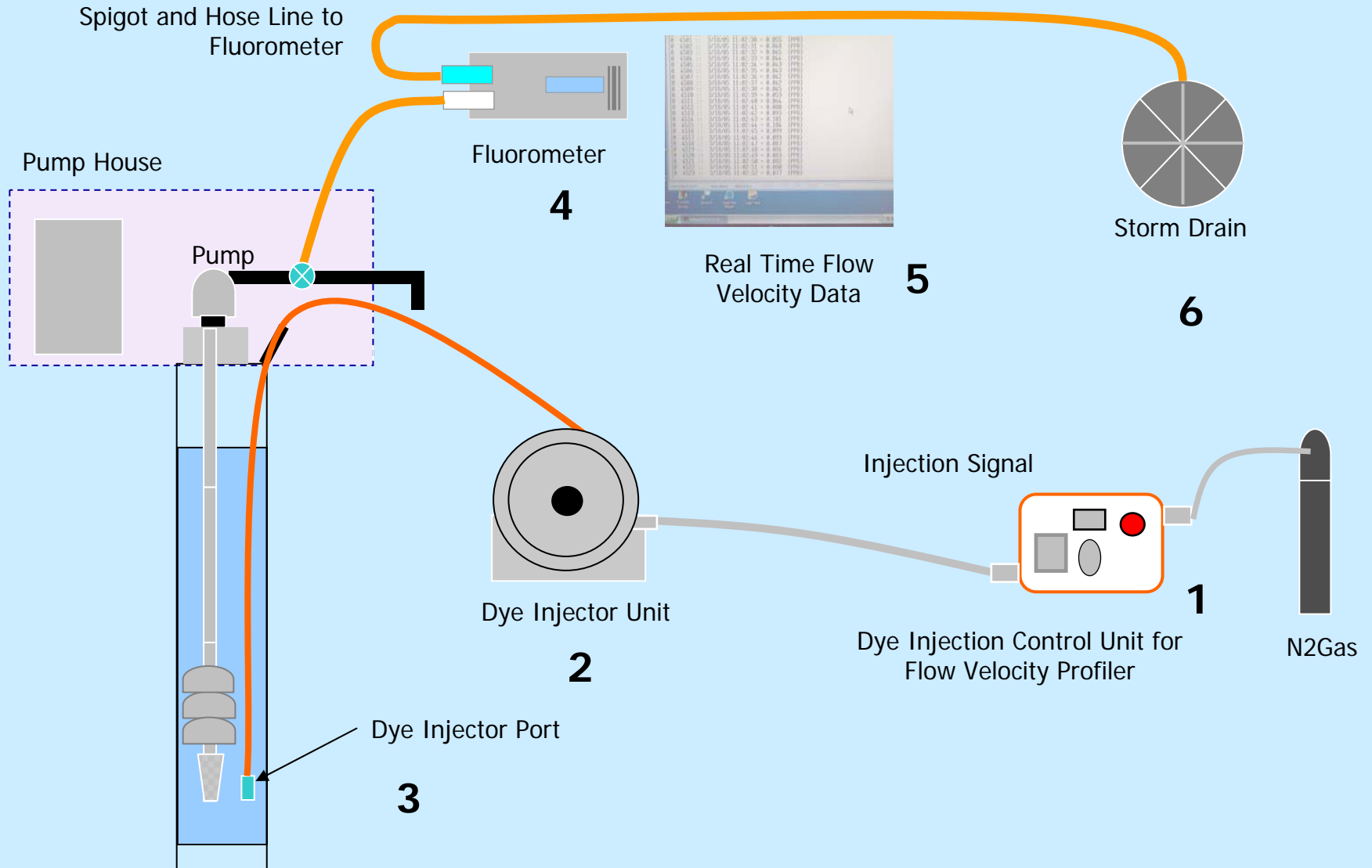
$$908.6 \text{ GPM} / 1,500 \text{ GPM} = 60\%$$

CONCLUSION

Therefore, 908.6 GPM or approximately 60% of total water production is derived from 170 to 190 feet BGS, as indicated by the green bar.

Water Supply Well Diagnostic Services

DyeTracer / HydroBooster Services (continued)



Water Supply Well Diagnostic Services

DyeTracer / HydroBooster Services (continued)



These photos show an alternative to BESST's Well Diagnostic Services.

The process of removing a water production pump is costly.



BESST's HydroBooster / DyeTracer systems are used with the pump in place and in operation, **eliminating the need to remove the pump!**

