

US EPA ARCHIVE DOCUMENT

Leak Prevention

Swamped in Free Product? Rise Above It With PFP

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One of the first actions typically needed at a newly discovered UST release is removal of free product. In reality, however, this step doesn't always happen in a timely fashion. In fact, free-product removal often gets out of control, running up high cleanup costs without solving the immediate environmental problem and, perhaps, making it worse.

Gasoline held in residual form above the water table will, in time, affect groundwater quality if it is not remediated. When free-product removal is delayed or too slow, the seasonal rise and fall of the water table can cause contamination to "smear" into the vadose zone. Even the process of conducting a pump test can smear free product into previously uncontaminated areas.

Free product can also migrate into utility conduits, surface water, and basements. At a site in north Florida, for example, free product migrated into a pond resulting in significant fish kills and a threat to the health and welfare of children playing nearby. Early mitigation of the free product would have prevented significant environmental damage.

The time-and-materials (T&M) terms on which cleanup contractors have customarily

been paid for free-product removal practically invite such problems, because T&M rewards slow and ineffective work. An alternative payment approach, known as pay for performance (PFP), is a system whereby you pay the contractor for free-product removal and keep yourself from being swamped by spreading plumes and rising costs. PFP fiscally rewards quick starts and fast results with prompt, low-hassle payment. It also forces you to set clear, measurable environmental goals and a firm, fixed price for the free-product removal.

Here's How It Works

Under PFP, the cleanup contractor is paid according to the amount of contamination that is actually reduced (e.g., decrease in free-product levels measured in feet or inches), not for the amount of time and materials expended. No change orders are allowed. In a large-scale, long-term free-product removal (or full-scale site cleanup), PFP payments are triggered as contamination levels decline to milestone levels set in the terms of the PFP agreement.

Often in full-scale PFP cleanups, a free-product reduction goal must be reached as part of the criteria to receive the first performance payment. In small-scale PFP free-product removal work, the intermediate mile-

stone payments may be omitted and the contractor may be paid simply on attaining the end goal.

For example, if three wells are identified with 12 inches of free product, then a PFP milestone could be set for when the measurable quantity of free product is reduced 25 percent, or 3 inches, in each well. Successive

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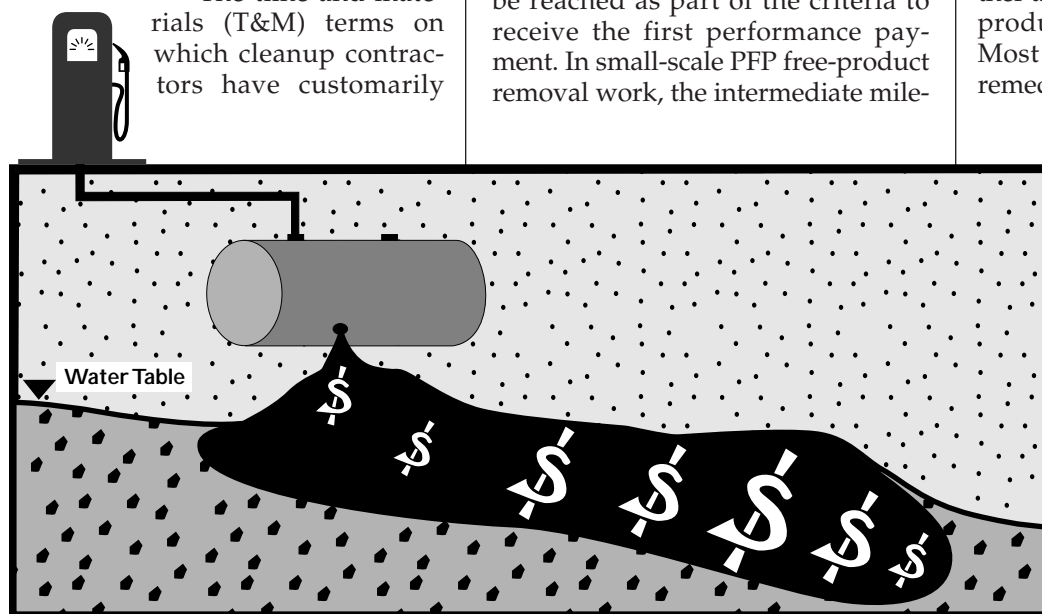
milestones could be set to trigger performance payments at 50, 75, and 99 percent reductions. As each milestone is reached, a milestone reduction payment is made until the final goal is reached and sustained.

The goals and the total price to be paid for a PFP cleanup are both firmly fixed at the beginning and do not change. On reaching a contamination-reduction milestone, the cleanup contractor submits independently confirmed monitoring data along with a request for the agreed-upon milestone payment.

Over 300 PFP cleanups are now in progress or completed in Florida, Oklahoma, and South Carolina. Some of these PFP cleanups focus only on free-product removal, with no further active remediation after the free-product removal goal is reached. Most also entail full-scale active remediation.

Where and How Free-Product Reductions Are Measured

A PFP cleanup also must specify where and how the free-product thickness data used to justify a payment will be collected and analyzed. In general, your PFP measurement plan should include payment-data collection locations and procedures that measure the contamination lev-



els directly in the environment at the cleanup site. It should also include data-collection locations and procedures to alert you if the contractor's approach begins to make the problem worse rather than better. In PFP you are paying for a clean site—not just a few clean measurement locations.

To measure free-product reductions for PFP milestone payments, identify the wells that have free product and record baseline levels of free product before beginning removal. For example, you can measure the apparent thickness of product in the aquifer by using an interface probe or an oil sensor. Once each well is measured and free-product accumulation recorded, set and measure the milestone-payment levels of free product in terms of thickness in each well.

Seasonal Water Table Variations and Measuring Free-Product Reductions

If free product is released during a dry season in certain lithologies, but its removal is delayed until (or includes) a rainy season, then the water table could later rise and smear the free product into the vadose zone, resulting in a misleading apparent reduction in free-product thickness as measured in the monitoring wells. Appropriate configuration of the measurement-payment criteria, sampling locations, and data-collection procedures will help to avoid this problem. You should take care that the free-product removal work really is removing free product and not just smearing it away into previously uncontaminated areas.

Seasonal variations in the water table should be taken into account when the measurements that trigger PFP payments are set up. Before you make a judgment on the total amount of measurable free product in each well, you should know when the water table has reached its peak and then collect the measurement data.

This collection can be done, for example, by preparing a hydrograph that shows water table elevations over time for the free-product removal site. A hydrograph will show potential smearing as opposed to real reduction in thickness for free product on the water table. It is also wise to monitor for three to six

months after the goal is attained to ensure that rebound does not occur due to a falling water table.

Also, know the groundwater flow rate and gradient to calculate potential migration speed and spread of the product plume. To minimize smearing across uncontaminated zones, avoid any type of pumping test that could cause free-product migration.

Ways Not to Measure PFP Free-Product Removal Progress

It is theoretically possible to measure free-product removal progress (and goals) based on the reduction in overall size of the free-product plume. Although software that may indirectly assist in this undertaking is being developed, it is not presently available. Thus, this method is not yet sufficiently reliable to be used for purposes of making PFP payments.

Do not measure PFP free-product removal progress by the amount of "effluent" free product that the removal system produces. It is not a direct measure of the environment that PFP is paying to clean up. In PFP payment measurement, data should be taken directly from the environment you are trying to clean up. However, most states require that influent data from the treatment system be reported. Both influent and effluent data can give you a check on the "thickness" data used to trigger a PFP milestone payment.

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Timing and Time Limits for PFP Free-Product Removal

Timing is a practical consideration in setting the schedule for PFP free-product removal. If the free-product release takes place at the beginning of a period when the local water table is normally low in sandy or sandy clay lithologies, you should set the PFP time limit so that your goal is met

before the water table rises again.

If the free-product removal job begins too late in your "dry" season to reach your goal before the water table rises again, then withhold some contractor performance payments until the next dry season. Then make those payments if the free product has not exceeded your goal levels. If the site does not remain at or below goal levels, withhold payments and have the contractor resume appropriate remedial action until the site reaches and retains your free-product goals.

Goals for a PFP free-product removal job can be set so that a specific thickness of free product must be reached within a given time frame. For example, a goal for a PFP free-product removal might be to reach 1-inch thickness within 60 days of the effective date of the PFP contract.

Setting and Estimating the PFP Fixed Price for a Free-Product Removal Job

In PFP, we distinguish *setting* the firm fixed price that caps the amount to be paid out from *estimating* the actual cost of a PFP cleanup. The price is the dollar amount that the buyer agrees to pay (or reimburse) for reaching the cleanup goal. The cost of the cleanup is the actual amount of money spent to accomplish that goal. In reality, the cost can turn out to be either more or less than the price that was set for the job. The PFP price does not change, regardless of the actual cost. In PFP, Price minus Cost equals Profit.

A PFP cleanup price may be set (1) by public, competitive bidding, (2) by negotiation between the payer and the cleanup contractor, or (3) by the state based on some "fair and reasonable" rate schedule. Experience shows you will pay the lowest price for a PFP cleanup by using public, competitive bidding, with award to the lowest bidder.

Based on the number of bidders attracted when South Carolina publishes requests for PFP bids, confident, competent cleanup contractors find PFP cleanups an appealing business opportunity. Besides the prospect of gaining a healthy profit for working smart, PFP progress payments are typically made within a

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few days of confirmed progress documentation.

PFP also has mechanisms for assuring that the contractor is held responsible to reach the free-product removal goal within both the time limit and the fixed price that is set for the cleanup, regardless of the cost of the work. In general, the cost of a free-product removal cleanup at a given site can be estimated and the price can be set based on the thickness and size of the plume and the physical characteristics of the site.

Strong PFP Fiscal Incentives and Good Contamination Measurement Foster Success

PFP is a very effective framework for accomplishing free-product removal quickly and with minimal further environmental harm at the best possible price. PFP accomplishes this goal because it gives the contractor a strong financial incentive to reach clearly set goals as quickly as possible. For more information about PFP, e-mail Bill Foscett at foscett.william@epa.gov. ■

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