

# Implementing Oil Skimming Solutions

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## Chemical

### Wastewater Treatment

**Oil Grabber® Model 8**

#### Reichhold Chemical Corporation

### Model 8 Oil Grabber® Removes Small Amounts of Oil from Plant Drain Water

**Problem:** Worldwide, Reichhold Chemical Corp. produces some 5600 products. At St. Helens, Ore., they produce three—urea, ammonium nitrate and ammonia. Plant drain water is discharged into the Columbia River, and although oily residues are minuscule because of a concerted program to keep oil off the floors, some is present—drippage from ammonia compressors, vehicles and machine maintenance chores.

Although the amount of oil in drain and stormwater is not high, both plant and regulatory officials want as close to zero discharge of oils as possible. Removing a minute concentration of oil effectively is a challenge, however.

**Solution:** All plant drainage, washdown and storm waters are channeled through floor and street drains into a two-compartment API settling chamber which is also used for collecting other oily residues at the plant such as crankcase oil. The oil is given time to rise in a sump, and is periodically drawn off by an 8" wide stainless steel belt at a rate of 32 gal./hr. Wiper blades continuously remove oil from both sides of the belt. Oil is then transferred to a holding tank.

A second skimmer is used in a sump that drains only the urea plant. Here, process water is cleaned of oil by the skimmer, then reclaimed in a steam stripping concentrator for reuse. Again, the volume of drippage oil that gets onto floors is small. During heavy rains, runoff into this sump can be diverted to the API channel for further treatment.

**Results:** Skimmers fill a need for effectively removing small amounts of oil from drain water. Only a few gallons are collected every two months from this source—but zero oily discharge makes Reichhold a good neighbor in an environmentally conscious neighborhood. Skimmers require little maintenance time compared with the alternative route of constructing plant-made hose or belt skimmers.

*Published in CHEMICAL PROCESSING MAGAZINE*

### Wastewater Treatment

**Oil Grabber® Model 8**

#### Schenectady Chemicals Canada, LTD

### Oil Skimmer Technology offers Pollution Solution that Saves Money instead of Raising Operating Costs

*Oil skimming is a simple, dependable and effective means of removing oil from water. And unlike some other processes, it offers users the potential for major cost savings.*

At Schenectady Chemicals Canada, Ltd., plant manager Fred Soukereff estimates that his company has saved \$ 5,000 annually by using the skimmer instead of former

# Implementing Oil Skimming Solutions

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methods of waste removal. “The real saving, however, is in the fact that we have a much cleaner plant effluent discharge,” he points out.

The individual designs employed in oil skimmers may vary widely, but all oil skimming devices rely on two well-known scientific principles: specific gravity and surface tension.

Oil is lighter than water so it floats to the surface. Floating oil clings to materials more readily than water so it can be picked up by passing a belt or pick up media through the surface. Oily material adheres to the media and is removed, while water runs off.

Schenectady selected an Abanaki **Oil Grabber Model 8** Skimmer for its Toronto, Ontario plant. The unit which is installed outside the plant operates with an 8 inch wide, 13 foot stainless steel, corrosion resistant belt.

Results, to date, are impressive. Schenectady’s wastewater discharge meets Toronto municipal bylaw standards for ratio of oil to water, measured in parts per million. The new Toronto standards limit the discharge of mineral oil to 15ppm, and natural oil and grease to 150ppm. The Abanaki system is capable of skimming solvents as well as resins and oil.

Soukereff explains the operation: “We use a two stage interceptor system to separate any oils and solvent in our wastewater. Prior to the installation of the Abanaki skimmer, this interceptor had to be cleaned out annually, at considerable cost. The high costs were partially due to the premium we had to pay for the water content of the mixture.

“It was a trade magazine article that caught my attention. It discussed how oily waste could be removed from water using an oil skimmer. That’s how we came in contact with Abanaki.”

Schenectady had a mixture of solvents, resin and oil/water interface so they were skeptical as to whether an oil skimmer would work for them. Test strips of the stainless steel belt material appeared to pick up some of the solvent.

Based on the ease of installation and the low cost of the Abanaki skimmer, Schenectady decided to try a unit with a 6 foot belt. The results were encouraging, says Soukereff. “We found that the belt picked up the solvent and the interface readily, and kept the interceptor relatively free of the solvent resin layer,”

“Once we found that the skimmer worked, we installed a more permanent and winterized system with a longer belt. It has been in routine service since March 1991, with little problem,” says Soukereff.

At Schenectady, one maintenance operator monitors the operation on a routine basis.

According to oil skimmer manufacturer Abanaki, the experience at Schenectady of actually saving money after installing a skimmer to assure compliance with environmental regulations isn’t all that rare. Skimming is a simple, effective means of removing floating oils, and other similar contaminants, and skimmers like Abanaki’s are so easy to install, operate, and maintain that users often achieve savings based on decreased maintenance costs alone.

A second source of savings results from the fact that a properly installed system can provide a very good separation of the oil and water. For some users, the important part is to be able to discharge the water without further treatment, while for others, the important part is having to pay only for the disposal of the actual contaminating material instead of a much larger volume of contaminates mixed with water.

# Implementing Oil Skimming Solutions

## Environmental/Recycling

### Container Recycling

**Oil Grabber® Model 4**

### Barrel Reconditioning Industries

## Industrial Container Recycling Simplified By Oil Skimmer

*Barrel Reconditioning Industries (BRI) of Cottage Grove, MN builds recycling systems for both metal and plastic containers, including lubricating fluid drums and barrels.*

A typical BRI system consists of several integrated machines or stations, including a solvent preflush and a high pressure water wash. The water wash presents two distinct problems. First, oil and grease contaminated washwater can plug spray heads and filters, reducing system effectiveness. Second, disposing of wastewater contaminated with oil, solvents and other hydrocarbons costs as much or more than disposing of a used barrel.

To reuse the barrel reconditioning water, oil, solvents and other hydrocarbons must be removed along with solid contaminations. Jay Ahern, BRI's president uses an **Oil Grabber® Model 4** made by Abanaki Corporation, Oil Skimmer Division of Chagrin Falls, OH. The skimmer specified by BRI is made of stainless steel for trouble-free operation under high temperatures and harsh chemicals.

The skimmer makes use of the differences in specific gravity and surface tension between oil and water. These physical characteristics allow a moving collector in the shape of a belt, operating on a motor and pulley system, to attract oil and other hydrocarbon liquids from the surface of the fluid. After traveling over the head pulley, the belt passes through tandem wiper blades where oil is scraped off both sides of the belt, and discharged. The tail pulley has flanges which allow it to roll freely on the inside of the belt without becoming dislodged. It requires no bearings and does not need to be fastened to the tank. If turbulent conditions exist, an optional tether and cage assembly prevents the tail pulley from being dislodged.

BRI makes a wide variety of equipment for different types of containers, so flexible design options are important. The Abanaki skimmers accommodate many different configurations with customized belt lengths, different mounting configurations and various motor options.

According to Ahern, "Over the years we've tried a lot of different types and manufacturers—coalescers, tube skimmers, disk types and others. But, we always come back to Abanaki belt skimmers. Even when we are using coalescers and filters, the Oil Grabber improves their efficiency by preventing an overload of too much oil."

*PUBLISHED IN HAZARDOUS MATERIALS MANAGEMENT.*

### Groundwater Remediation

**PetroXtractor®**

### BJAMM Environmental, Inc.

## Underground Gasoline Extraction Made Easier

*The Abanaki PetroXtractor® Well Oil Skimmer, used for the removal of oil, fuel, and other floating hydrocarbons from water, where access is limited, was recently evaluated by BJAMM Environmental, Inc. of Canal Fulton, Ohio. Working closely with the Ohio EPA and the Bureau of Underground Storage Agency, this group of consultants deals primarily with gasoline stations using underground storage and industrial sites concerned with ground water contamination. They define potential risks and provide ongoing monitoring and reporting until a no further action status is achieved.*

# Implementing Oil Skimming Solutions

Always researching new resources and tools to provide better service to their customers, BJAMM became aware of the Abanaki Corporation's oil skimmer technology. Dave Sears, a Research and Development Troubleshooter for the company, was given the Abanaki **PetroXtractor**® Oil Skimmer for evaluation. The PetroXtractor is ideal for the removal of floating hydrocarbon liquids and can help reduce the oil or fuel content in water to an acceptable EPA level. Designed for those applications that have a limited access area and a deep drop between the mounting surface and the surface of the liquid, it is especially successful in groundwater monitoring wells, recovery wells, and underground tanks.

In dealing with spills, BJAMM has several alternatives at their disposal. They can use monitoring wells to check contamination levels and in some cases use the Abanaki PetroXtractor skimmer to bring contaminate to acceptable levels. For the monitoring and recovery of free floating gasoline products BJAMM may use an existing monitoring well or will drill new wells if necessary. The Abanaki PetroXtractor is very successful in this type of application. The company uses the PetroXtractor A in monitoring wells. "Abanaki's one-inch belt works in these small wells and in some cases will reduce the number of new wells needed" explains Dave Sears. BJAMM has mounted the skimmer on a mobile hydraulically elevated table. "The platform can be raised/lowered about 20 inches. This allows us to move the PetroXtractor from one well to the next...and adjust for variation in water level." Recovered gasoline products are then discharged into 55 gallon drums. A local waste management company disposes of the drum.

A dependable and cost effective means of removing oil, fuel and other floating hydrocarbons from water, the Abanaki PetroXtractor Oil Skimmer unit can be used anywhere electric power or compressed air is available. Explosion proof and pneumatic motors are an option for use in areas where combustible fumes may be present. The skimmer's rugged construction keeps it running under the most severe conditions.

Dave Sears feels "the skimmer does a good job". He likes the way Abanaki listens and responds. "The original one-inch belt supplied with the PetroXtractor tended to twist and curl up...we told Abanaki that "we thought it might be too thin." They responded by supplying a belt with a thicker backing... and this has worked much better..."Abanaki listens to our feedback and is very helpful". He expects to use the skimmer on other sites for gasoline products and has a proposal pending to use it for oil recovery in industrial settings.

## Groundwater Remediation

**PetroXtractor**®

### Chemviron Midwest, Inc.

## Portable Belt Skimmer Cleans Up Contaminated Groundwater

*Chemviron Midwest, Inc. an industrial consulting and remediation firm in Wooster, Ohio frequently needs to recover hydrocarbons from groundwater.*

Typical situations include remedial studies, soil contamination, groundwater studies, environmental compliance, permitting applications and environmental site assessments during property transfers.

Because of the variety of situations encountered, the firm wanted a highly flexible recovery tool, preferably portable.

After weighing the advantages and disadvantages of passive methods and active pump systems, Chemviron selected a **PetroXtractor**® active belt skimmer from Abanaki Corporation, Chagrin Falls, Ohio.

Chemviron has successfully used the skimmer at several different service station locations. Most recently, the firm used the belt skimmer at a retail service station in the Cleveland, Ohio area as an interim corrective action required by the State Fire Marshal's office, who oversees U.S. EPA-mandated cleanup programs. The station has a 1,000-gallon underground holding tank for used motor oil. Oil, either from the tank or nearby residents who have dumped spent oil, leaked into the backfill as well as the soil surrounding the tank and contaminated the groundwater. The PetroXtractor recovered about one to two gallons of oil daily.

# Implementing Oil Skimming Solutions

Chemviron plans to use the Abanaki belt skimmer to recover oil-based hydraulic fluids used in service station automotive lifts and found at garage sites. Additionally, the firm may use oil skimmers as a preemptive strategy to remove oil, grease, fuel and solvents from wastewater in wash bay sumps of many automotive service shops. With adequate hydrocarbon removal, the sump fluid may be allowed to drain into a municipal sanitary sewer system. Otherwise skimming may be a crucial step in recycling the fluid. The latter option would eliminate the cost and liability of fluid disposal.

*Published in ENVIRONMENTAL PROTECTION*

## Groundwater Remediation

**PetroXtractor®**

### MACTEC

## Leading Engineering Firm Tackles Ocean-Front Remediation with Well Oil Skimmers

### PetroXtractors Pull Nothing But Product at Two Recovery Wells

*For most people, the phrase “ocean-front property” carries a pleasant cachet. For project engineer Stephen Hanks, “ocean-front property” just meant a headache with a view.*

Hanks, who works for the Atlanta-based consulting firm MACTEC, was in charge of an ocean-front property containing a bulk fuel storage terminal. That terminal continued to create challenges caused by a spill that happened about 10 years ago. MACTEC engineers had dug a recovery trench to keep contaminants from leeching into the nearby natural water source. However, because of the site’s close proximity to a coral reef, this solution proved untenable in the long term. The coral would re-grow in the trench.

Recovery wells were installed, but engineers quickly realized that this direct recovery approach needed additional support to be 100 percent effective. When the floating pump system mounted on the wells began to fail, Hanks knew it was time to do additional research.

Problem solving comes naturally to MACTEC, a leading consulting firm of 3,000 employees in 80 locations. It provides engineering, environmental and construction services to public and private clients worldwide. The company’s core values of quality and accountability contribute to its ranking as a top design firms. A commitment to operational excellence was one reason the company chose to install two Abanaki **PetroXtractor®** Well Oil Skimmers to ensure effective remediation on its ocean-front project.

Hanks was looking for a solution that provided the accuracy of a pump to pull fuel from the surface of the well water — but without the complications. “The pump method ultimately failed because it had too many parts and needed to accommodate too many variables. The fluctuating salinity of the water caused the pump float to sink, and the tidal influence posed a tremendous obstacle,” Hanks explains. “Pump controls needed to be calibrated very accurately to the specific gravity of the fuel and water. We needed something less maintenance-intensive and more reliable.”

After an extensive online search, Hanks looked to a flagship product from Abanaki Corporation – the PetroXtractor. Two units were installed on different recovery wells on the site. With the ability to separate oil from the water surface from an elevation of up to 100 feet without a pump, the PetroXtractors maintained skimming efficiency even in the fluctuating water levels created by the tide. Their continuous belt action made use of the differences in the specific gravity and surface tension between oil and the water to attract floating oil from the well surfaces and skimming it very efficiently without additional labor. The fact that the units skimmed very little water during recovery was an added bonus that he and his team soon discovered.

“Prior to installing the Abanaki PetroXtractors, weekly visits to the well sites were made so that the fuel could be pumped by hand using diaphragm pumps,” Hanks says. “The skimmers are run approximately

# Implementing Oil Skimming Solutions

16 hours per week, and have been working very well. Because the skimmers are not pumping water out of the wells there is no water treatment issue, which is a major benefit.”

The PetroXtractors’ simplicity was another asset. After picking up the oil, the belts travel over head pulleys on each drive unit and through tandem wiper blades. Oil is then scraped off both sides of the belt and discharged through a small hose. Installation consists of merely lowering the belt and tail pulley into the casing until the pulley is fully immersed, placing the discharge hose in a container and switching the unit on.

“When dealing with remediation projects that can last over a period of many years, complicated systems are difficult to pass on as new project managers take over,” Hanks says. “The PetroXtractor is great for long-term projects and can easily be passed on with little explanation of how it works.”

“The PetroXtractor system is not complicated and was very simple to set up. Other systems using pumps have a complicated logic system control panel, which makes the pumps work in series when dealing with multiple wells at a site. When one part of this system goes down, the whole system goes down. With the multiple PetroXtractors installed at one site, each unit works on its own and can continue to operate should other units require maintenance.” he adds.

Most of all, the Abanaki oil skimmers have been consistent with MACTEC’s focus on making their clients more successful with value-added services. “With the Abanaki PetroXtractors in place site visits are much less labor intensive and the PetroXtractor has proven to be about 20 to 30 percent more efficient than manually pumping the wells,” Hanks says.

## Hydraulic Oil Recovery

**PetroXtractor®**

### McLaren/Hart, Inc.

## McLaren/Hart Inc. Has Success Cleaning Hydraulic Oil

*McLaren/Hart, Inc., a full-service environmental engineering company with offices across the United States, was tasked with bringing a cost-effective solution for the automation and expeditious recovery of a heavy gear oil / quench oil from the subsurface of an automotive manufacturing facility. After evaluating several active recovery systems that would meet the free-product recovery objectives at the site, Adrian Bilger of the Albany, New York office, selected the Abanaki PetroXtractor system.*

Two Abanaki belt skimmers were installed as replacements for passive recovery systems that had been in operation at the site’s recovery wells. The **PetroXtractors** not only automated the recovery, but also added the advantage of cost-effective efficiency in comparison to the labor-intensive passive recovery system operation. Installation of the two units, including setup and adjustments, was completed in approximately four hours time, which helped to minimize overall project costs.

“During a preliminary test at one of the wells, the PetroXtractor recovered three-and-a-half gallons during a three hour period,” Bilger said; “the previously operated passive, bailer-type recovery system promoted recovery of only two gallons per day.”

Adrian Bilger went on to say, “McLaren/Hart intends on using these units in the future to recover LNAPL (light non-aqueous phase liquids) from the subsurface at various manufacturing facilities. The Abanaki PetroXtractor promotes efficient product recovery for sites where cost considerations and the necessity for automated recovery are critical design elements.”

*Editor’s Note: The **PetroXtractor** also works on some DNAPL’s such as coal tar and heavy #6 fuel oil!*

# Implementing Oil Skimming Solutions

## Wastewater Treatment

**Mighty Mini®**

### Idaho Recycling/Consulting and Associates

## Oil Skimmer Prevents Groundwater Pollution While Saving Costs

*Idaho Recycling/Consulting and Associates (IRC) of Glenn's Ferry, ID helps small generators of industrial wastewater prevent groundwater pollution and comply with environmental regulations by recycling contaminated water, a method that is less expensive than disposing of fugitive oil, solvents, gasoline and other hydrocarbons.*

A typical IRC recycling system for such small generators as truck stops, construction equipment and agricultural machinery service shops includes a settling tank and a **Mighty Mini®** oil skimmer made by Abanaki Corporation of Chagrin Falls, OH. Other oil/water separation methods are effective, but are usually more expensive than skimming, and many will not easily handle the volume of oil that skimming handles.

The skimmer's belt is operated by a motor and pulley system, which keeps it in motion whenever the unit is activated.

The design uses the difference in specific gravity and surface tension between oil and water to pick up oil, grease and other hydrocarbon liquids as the belt passes through the washwater. The one inch belt can remove up to one gallon of oil per hour from the surface of the water. The two inch belt can remove up to two gallons or more of oil per hour. The belt runs over a tail pulley connected to a stabilizer bar that is lowered into the washwater. After the belt passes over the drive pulley, it travels through tandem wiper blades where the oil is removed into a discharge channel. The oil then flows into a coolant saving Abanaki **Oil Concentrator®** where any residual water picked up with the oil is separated and sent back to the wash tank. The water-free oil is then discharged into a waste oil container.

The skimmer oil is then hauled away and recycled. Or, the oil can be used as an alternate energy fuel. Such savings easily pay for the cost of the equipment used.

Cost savings and prevention of groundwater pollution, plus conservation of natural resources, are solid reasons to try Abanaki's **Mighty Mini** oil skimmer today.

*Published in THE NATIONAL ENVIRONMENTAL JOURNAL.*

## Recovering DNAPL

**PetroXtractor®**

### DNAPL Recovery

## DNAPL Recovery Made Easy

*Recovering DNAPL (Dense Non Aqueous Phase Liquid) product is never an easy task. Recovering an extremely viscous DNAPL, such as coal tar, can be a nightmare. With viscosity approaching 20,000 ssu at ambient temperatures, devices that need hydrophobic screens become useless; however, the solution is simple – a PetroXtractor® belt oil skimmer made by Abanaki Corporation, Chagrin Falls, Ohio.*

Coupled with their specially engineered Polybelt, the **PetroXtractor** has successfully been installed, tested and is working at several sites to remove coal tar and other DNAPL's from wells and sumps.

An east coast utility has been recovering a coal tar product for several months utilizing this method. It has three wells that require all three sizes of the **PetroXtractor** – the PX-A (2" wells), PX-B (4" wells) and PX-C (6"+ wells). Product is located between 35' and 40' deep in their wells. Each of the units is equipped with a timer to reduce water pickup, pad heaters to help product flow out of the unit and ceramic wiper blades, which will virtually eliminate wiper blade wear.

# Implementing Oil Skimming Solutions

Another site, in Washington state, has been removing a #6 fuel oil/ Bunker C that sinks, floats and is neutrally buoyant. They are utilizing six **PetroXtractors**, model PX-A with 4 on customized stands. The typical stand is 4’ tall, but because of special requirements 2’ stands were needed. This product is also located 35’ to 40’ deep and their units are set up the same as those on the east coast, without the timers.

“We learned some valuable lessons from these sites,” says Bob Thibodeau, Abanaki’s Product Manager for the PetroXtractor line. “Each site had unique problems that we had to address. We made a few changes to our standard unit, and their **PetroXtractors** have been working successfully ever since.”

Abanaki’s reputation for working with customers to resolve problems is well known throughout the industrial sector and is quickly becoming known in the remediation field as well. A full, unconditional, money-back guarantee is offered for 30 days in addition to the standard one year on parts and workmanship (belts and wiper blades are 60 days).

## Jet Fuel Recovery

**PetroXtractor®**

### HSI GeoTrans

## Oil Skimmer Helps Jet Fuel Recovery System Fly

*How do you recover free-phase jet fuel (JP-5) from nearly seven acres of air station groundwater under a tank farm? HSI GeoTrans, an environmental engineering and consulting firm out of Reno, Nevada, working in cooperation with a federal agency and private concerns, developed a cost-efficient and technically-effective remediation system to do just that. Innovative solutions, including the **PetroXtractor® Well Oil Skimmer**, made by Abanaki Corporation, Oil Skimmer Division, of Chagrin Falls, Ohio, made a difficult task surmountable.*

Unpredictable site geology determined the use of a trench collection system that allowed free-phase product to be removed. Difficult geology for trench installation dictated an innovative one-pass trenching system which prevented collapse of the sidewalls and inflow of sand as well as saving cost during construction. Ex-situ bioremediation was used to treat the fuel-impacted soil and avoid costly hauling and disposal charges. Additionally, the explosion proof Abanaki, electric belt skimmers were used to easily and economically extract free-phase product from several recovery wells installed in each trench without the need for expensive groundwater extraction and treatment or concern for fluctuating water table levels.

The use of Abanaki belt skimmers, instead of conventional product pumps and skimmers, saved the government additional equipment costs by avoiding the use of air compressors. Using belt skimmers, HSI GeoTrans is also saving their client money by avoiding the routine maintenance requirements of other product recovery equipment. Since all moving parts on the belt skimmers are above ground to allow easy access, the government will continue to save money by avoiding time-consuming removal of downhole equipment during scheduled maintenance.

## Wastewater Treatment

**Oil Grabber® Model MB**

## Recycler Uses Belt Skimmer to Reclaim Oil from Filters

*“The equivalent of three Exxon Valdez oil spills! That’s the approximate amount of used motor oil released into the environment each year by improperly discarded oil filters.” — Jim Nickerson, president of Nickco Recycling, a Pittsburg, TX recycler of used oil filters.*

Originally a recycler of scrap metal, Nickerson saw a need for safely salvaging the mountain of used oil filters discarded each year in this country. So, in 1992, he developed his own proprietary process and created a business to recycle oil and filters. Nickerson’s process involves three distinct steps: crushing, heating and skimming.

# Implementing Oil Skimming Solutions

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Today, Nickerson’s company handles some 50,000 used oil filters every day and recovers up to 800,000 gallons of waste oil annually. In addition to oil, the steel, rubber and paper components of the filters are also recycled. Nickerson describes the process as “One waste stream in and three reusable material streams out.” In addition to the obvious benefits to the environment, recycling used oil filters saves money, reduces the country’s dependence on foreign oil supplies and puts scrap steel back into production.

Waste oil collectors gather used filters from auto dealers, repair shops, oil change outlets, rail yards, heavy equipment service centers and other industries and bring them to Nickerson’s state-of-the-art 30,000 sq. ft. facility. The filters are first crushed and partially drained in a special concrete containment pit. The pit’s triple containment fail-safe design ensures that no oil escapes. The oil released at this step is piped to a holding tank.

The crushed shells are loaded into a box car-sized furnace where they are heated to 500°F for up to 14 hours. This part of the process releases the remaining oil. At the same time, the paint is burned off the metal which will be sold for scrap. The rubber gasket and paper filter element are reduced to a usable residue which is shipped to area power plants where it is mixed with coal and burned to produce electricity.

The heated oil drains from the furnace into a water-filled pit where it is skimmed off the surface and routed to a holding tank for pickup. The water-filled pit is critical to the recycling process. Not only does it collect the bulk of the used oil, but water drawn from the bottom of the pit is used to cool the furnace during the few hours it takes to load and unload a batch of filters. To perform the function efficiently and safely, the water must be relatively free of oil contamination.

“At first,” says Nickerson, “we used a suction hose to skim the oil off the surface. We quickly realized this method was too time consuming, messy and inefficient. Either too much oil remained in the water or we sucked up too much water with the oil when the oil film thinned.” Nickerson felt “There’s got to be a better way!” That’s when he turned to Abanaki Corporation’s Oil Skimmer Division for a solution.

In place for over two years, the Abanaki Oil Grabber **Model MB** uses two 8” wide belts and stationary wiper blades to skim the water surface to remove up to 200 gallons of oil per hour. The unit is critical to the recycling process and, according to Nickerson, “attracts a lot of attention from regulators and legislators from Texas and other states who regularly tour” the plant to learn more about the benefits of oil filter recycling.

“The unit is virtually maintenance-free and it operates 24 hours a day, 7 days a week” says Nickerson who plans to purchase two more Abanaki skimmers when he completes a million dollar expansion to double his capacity to 100,000 filters a day.

*Published in POLLUTION EQUIPMENT NEWS*

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## Food Processing

Washwater Treatment

**Oil Grabber® Model 4**

**Kankakee Tank Wash**

### **Top Tank Wash in Midwest Uses Abanaki Oil Skimmers to Save Costs (and Stay in Compliance)**

**Model 4 Oil Skimmer Handles Oil Removal for Busy Food-Grade Wash Station**

*From a key location about midway between Indianapolis and Chicago, Kankakee Tank Wash services companies from all over the United States, providing high quality interior washing of food-grade trailers.*

# Implementing Oil Skimming Solutions

*Kankakee's two bay operation is certified not only as a food-grade wash station for a variety of cargo—from liquid commodities to dry bulk—but also as a Kosher wash station.*

## Meeting stringent standards

“A lot of haulers coming up from the south or the West Coast switch their loads on the return trip. For example, a run bringing orange juice up from Florida often will carry milk back on the return trip,” Tim Ryan, president of Kankakee Tank Wash, explained. “So we adhere to extremely stringent wash requirements in order to prevent cross-contamination of different cargo.”

General food industry standards require the inside of a tank be residue-free of any prior incompatible cargo. Kosher standards require the tanks be free of any cargo residue incompatible according to Orthodox Jewish dietary laws. And, of course, all food-grade tanks need to be kept free of all possible contaminants such as mold, bacteria and rust.

Kankakee Tank Wash uses a computerized wash system that sits right inside the trailer to ensure thorough cleaning and rinsing even for areas that would otherwise be hard to reach, such as the top inner portion of the tank. With a small amount of manual preparation, the wash system computerizes the entire cycle, from a food-grade wash and sanitized rinse through blow dry. It is even programmable to cleanse specific cargo loads.

The wash station handles about 45 trailers a day over two shifts. The high level of business requires approximately 15,000 gallons of water per day. Increasingly stringent regulations governing food-grade tank washing such as the EPA's Safe Drinking Water Act have required specific steps for the removal of vegetable oils, greases, and animal fats from Kankakee's wastewater stream. Moreover, the local sanitary sewer system does not allow oily wastewater, a common challenge for tank washing facilities. Ryan had inherited a system of chemical treatments when he first came on the job, but quickly found the process too cost-prohibitive.

## Discovering the Abanaki advantage

Then Ryan read about Abanaki in a trade magazine, and became interested in learning more about a process described as effective and cost-effective- oil skimming. Oil skimming makes use of the differences in specific gravity between oil and water to attract oil and other hydrocarbon liquids from the water's surface. This makes it highly effective for facilities that need to process organic waste from washwater in a very efficient and cost-effective manner.

The company sent a salesperson to assess the facility and explain how their industry-leading skimmers might be well suited to Kankakee's situation.

“The folks at Abanaki were terrific,” Ryan said. “They explained the basics, and they walked through the facility with us. Together, we decided on the best set up.”

Ryan first selected the Tote-It Portable Oil Skimmer that removes about 12 gallons of oil per hour through a continuous belt and wiper action. Because it is so small, the Kankakee crew found it easy to move it from one bay to another. The unit proved to be low maintenance and effective. As the operation grew, however, Ryan asked Abanaki if they could recommend a larger unit to keep up with the increased capacity. The decision was made to go with the Abanaki **Oil Grabber. Model 4** Removing up to 20 gallons of oil per hour, the Model 4 is still ideal for applications like mobile equipment washing facilities where excess space is often at a premium. From a mere shimmer on top of water to a heavy oil slick, the Model 4 utilizes a continuous belt and wiper to remove the contaminants, often reducing oil content to less than five parts per million in water.

## Real results

Ryan acknowledges that the Model 4 is effective in processing wastewater from both bays. The unit is mounted on the floor where both bays can drain into it. The belt, operating on a motor and pulley system, runs through contaminated liquid to pick up oil from the surface. After traveling over the head pulley, the belt passes through tandem wiper blades where oil is scraped off both sides of the belt and discharged

# Implementing Oil Skimming Solutions

into a 350-gallon tank. Once a week, the container is taken out via forklift to a roll-off dumpster and the contents are properly disposed.

“Abanaki has kept us in compliance,” Ryan said, “and helped us save money, too. Our costs associated with removal and disposal run about 40% less than with the other methods we tried.”

## Waste Stream Treatment

**Oil Boss®**

### Quaker Oats

## Quaker Oats Uses Skimmer To Reduce Wastewater BOD Disposal Costs Approach \$250,000 Annually

*The Quaker Oats plant in Peterborough, Ontario, Canada produces some seven million cases of Harvest Crunch® cereal and cake mixes annually. In the process, residue from the conveyors, dryers and other processing equipment ends up on the floor. Periodic equipment washdowns add water to the solid and liquid residue, which contains edible fats, starches and sugars. During house-cleaning operations, this liquid slurry flows into wastewater collection channels below the floors, and through a pipe that carries it to settling tanks in the basement of the 6-story plant. Since the wastewater flow can cover a wide range of rates, two settling tanks are needed to accommodate large surges.*

[In 1993] Quaker was treating this waste stream by simply suctioning off floating oil and solids from behind weirs on top of the settling tanks. Below the surface, water was decanted into a line leading to Peterborough’s sanitary sewer system.

Although simple, this treatment process was scarcely cost effective. A major expense associated with disposal of the semi-solid residue was the cost to have it hauled away and discarded in a landfill. This cost ran into six figures annually. Then officials from the Peterborough waste treatment plant told Quaker that the BOD content of their wastewater stream was excessive. In particular, oil levels exceeded the 15 ppm guidelines, which resulted in a sewer tax of \$127,000 (Canadian). With total disposal costs adding up to more than one-quarter million dollars annually, Quaker began looking for better alternatives.

### Lower BOD = Lower Disposal Cost

Quaker’s Plant Engineering Department was assigned the task of developing a lower cost disposal method for this waste stream. The need to separate water, oil and solids was clear. The challenge was to select equipment that was cost effective in terms of both original cost and operating expense, which did not create major maintenance problems itself.

The plan that ultimately developed was to install 100-mesh (150 micrometer) screens to remove solids upstream of heated settling tanks, and install oil/water separation equipment in the tanks themselves. Heating the tanks helps promote faster separation of oil from the water. Both screening and skimming contribute to lower BOD, and this arrangement minimizes problems caused by solids fouling the separation equipment. Although a number of separation technologies could work, the one finally selected was belt skimming, because of its simplicity and cost effectiveness.

Quaker’s subsequent search for a suitable separator led to Abanaki Corporation, a Chagrin Falls, Ohio firm that makes belt skimming equipment. Abanaki manufactures the **Oil Boss®**, which utilizes 304 stainless steel construction and removes up to 20 gallons of oil per hour. To handle the large influx of oil during Quaker’s house-cleaning operations, two skimmers were installed in each settling tank. By using two tanks, there is a backup if one system is taken out of service for maintenance. The total cost to add screening and skimming equipment to both tanks was about \$17,000 (Canadian).

### Operation of the System

Each settling tank allows enough quiescent time for thorough separation of oil and water. This is important because the Abanaki unit has a continuously moving belt that relies on free-floating (not

# Implementing Oil Skimming Solutions

emulsified) oil to work effectively. The difference in surface tension between water and oil is what imparts oleophilic properties to the stainless steel belt, which means it has more affinity for oil than water.

The stainless steel belt operates on a motor and pulley system that pulls it through the contaminated water surface where it picks up oil and fats. The fractional horsepower gear motor is totally enclosed and fan cooled. Various voltage options are available, as well as Food Grade Service options.

After traveling over the head pulley, the belt passes through tandem wiper blades where oil is scraped off both sides of the belt and discharged into a container. The tail pulley has flanges that allow it to roll freely on the inside of the belt without becoming dislodged. It requires no bearings and does not need to be fastened to the tank. A tether and cage assembly prevents the tail pulley from being dislodged and lost in the tank. Belt length is customized to make sure it stays in contact with the fluid surface at its lowest possible level.

Quaker approved the Abanaki unit because of its reputation for high reliability, low maintenance, and minimal operator involvement, which allows unattended operation. The only routine maintenance required is to clean and adjust wiper blade assemblies every 2 or 3 days, a job that takes only a few minutes. Occasionally, a skimming belt may need to be replaced. Other features that attracted Quaker's attention were:

- low volume of water pickup
- ability to handle fluctuating fluid levels
- small mounting area
- easy installation
- capability of lifting skimmed material up to 100 feet without a pump

## Fast Payback

Shortly after installation of its new separation equipment, Quaker's wastewater stream was tested by the city of Peterborough and found to contain less than 3 ppm oil. This resulted in the plant's tax bill being reduced to \$48,000, a savings of \$79,000 (Canadian) annually. Although sewer taxes subsequently went up for everyone in Peterborough, Quaker still enjoys substantial savings.

Equally important, Quaker's disposal costs for solids and oil have been virtually eliminated. By recovering edible oil with low water content, it can be mixed with the separated solids and sold to a bakery salvage company. With minimal processing, this mixture can be sold as swine feed. The price paid by the salvage company more than pays for the cost of shipping the residue to them, and there are no landfill costs.

After three years of experience with the Abanaki **Oil Boss**, Quaker has concluded that belt skimmer technology is the best one for the Peterborough plant. Skimmers with drum, disk, mop, and tube configurations might have worked, but they did not seem to offer as many advantages as a belt skimmer. Although other oil/water separation technologies are effective, including coalescing, membrane separation, and various chemical treatments, most are more complex and more expensive than skimming. Also, some of these methods do not easily handle the volume of oil that skimming does. The bottom line: belt skimming is a cost effective way to lower oil concentration to only a few parts per million.

*Published in POLLUTION ENGINEERING, Spring International Issue*

## Waste Stream Treatment

**Oil Grabber® Model 8**

### F.S. Repair, Inc.

## F.S. Repair Underscores Commitment to Quality

*F.S. Repair, Inc., a family-owned and operated business, provides a range of services from industrial repair, machine shop, welding & fabricating, gearing, and CNC capabilities. The company, located in Kingsley,*

# Implementing Oil Skimming Solutions

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*Iowa, incorporated in 1987 and continually strives to be the number one customer satisfaction company out there. Between Floyd Sitzmann and his two sons, Craig and Jamie, they have over 100 years of combined experience to offer their customers.*

Their company goal is to deliver quality products at a responsible and affordable price throughout the Midwest. So in 1995 when F.S. Repair's customer began experiencing a common challenge to the bottom-line in both cost and quality – wastewater – Jamie took action.

## Keeping Wastewater Clean, Key to Quality

Jay Sitzmann's customer was experiencing a problem common to the food processing industry. A leading poultry company was looking for an efficient and cost-effective way of eliminating and disposing of unacceptable levels of oils and greases in their wastewater from the plant's food processing operations.

Jamie went to the Internet to research a solution that they could use. He was looking for an efficient and cost-effective way to remove the contaminants, maintain a high level of quality and, at the same time, reduce cleanup costs as well as eliminate any associated liabilities. He discovered one of the easiest ways to accomplish all of these goals was to install an oil skimmer. Upon further investigation, he located a leading supplier of oil skimmers, Abanaki, and found a low maintenance, easy to use tool in the Abanaki **Oil Grabber® Model 8**. The flagship product specifically targets applications with a high risk of oil and grease in wastewater discharge.

## Lowering Hydrocarbon Levels, Quickly & Easily

With the help of the Abanaki technical staff that Jamie calls "second to none," he chose to distribute the Model 8 to his customer. Its belt-driven design works on the differences in specific gravity between oil and water. Water has a specific gravity of one and most oils have a specific gravity of less than one. This causes oil to float to the top of the water where it can be removed. The Model 8's belt action then breaks the surface tension of the water to attract and collect the floating oil. The belt passes through a set of wiper blades via a motorized head pulley where the oil is wiped off both belt sides and is allowed to flow through into a proper disposal container.

This type of skimmer maintains minimal operating space and maximum pick-up capacity. Because the Model 8's belt materials do not attract water, almost nothing but contaminant is picked up. Jamie reports that the Abanaki unit, which has the ability to separate oil at a rate up to 40 gph, was particularly appealing for its ability to produce "significant" savings in both time and money.

## Low Maintenance Benefits to Boot

The Model 8 also is designed for virtually maintenance-free operation. Flanges on the tail pulley allow it to roll freely on the inside of the belt without becoming dislodged. It requires no bearings and does not need to be fastened to the tank. Its stainless steel belt material makes it well suited to operating in high temperatures without added expense. If turbulent conditions exist, an optional tether and cage assembly prevents the tail pulley from being dislodged.

## How's it working for F.S. Repair's customer?

According to Jamie, the experience has been good from start to finish: "The people at Abanaki were extremely helpful in advising the right solution at the right price. Since the Model 8 was put into service in 1995, their customer only had to replace the belts. It's proven to be a very reliable machine with good benefits," he says.

# Implementing Oil Skimming Solutions

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## Waste Stream Treatment

**Oil Grabber® Model 8**

### Golden West Foods

## Frying Oil Reclaimed With Abanaki Oil Grabber® Model 8 Skimmer

*Golden West Foods' (GWF) circulating water system picks up more than 200 gallons of frying oil every day. The oil enters the wastewater drains during sanitary washdowns. This oil sediment plugs bends in the piping that returns oil to the fryer filter. This sediment—causing oil overflows - comes from the the coating on products such as onion rings and French toast made at the company's Bedford, VA plant.*

To keep the plant's water system in peak condition, the oil must be removed continuously. When done effectively, this oil can be reclaimed and sold for various uses. GWF has found that one of the most effective methods of removal is a belt skimmer from Abanaki Corporation, according to Chuck Tucker, maintenance manager with GWF.

Until 1973, GWF was using a floating suction skimmer powered by a pump with over 300 gallons per hour capacity. This high suction rate resulted in a great deal of water in the skimmed product, thus lowering its salvage value.

After screening large debris and passing through an intermediate storage area known as the wet well, the contents are pumped into the plant's 100,000 gallon equalization tank that provides a buffer for the waste treatment plant. "This tank held the floating suction skimmer that we previously used," says Tucker. "The skimmer frequently became clogged, so it was impossible to leave the unit unattended."

As a result of these problems, the company installed an Abanaki **Oil Grabber® Model 8**. This unit can remove up to 40 gallons of oil per hour—more than enough for the oil washed off during the plant's three-shift operation. The wet well was selected as the installation site because there is adequate dwell time to allow thorough separation of the oil and water. The skimmer works on the principle of surface tension. Oil and other hydrocarbon liquids are picked up as the belt passes through the surface of the contaminated liquid. After traveling over the head pulley, the belt passes through tandem wiper blades where oil is scraped off both sides and discharged.

"We selected the Abanaki unit because of its reliability and low maintenance which allows continuous unattended operation," says Tucker. "Other separation technologies are effective, but most are more complex than skimming."

*Published in FOOD ENGINEERING*

## Laundry

### Wastewater Treatment

**Oil Grabber® Model 8**

### Lord Baltimore Uniform

## Independent Uniform Rental Provider Ensures Effective Wastewater Management With Abanaki

### Lord Baltimore Installs Model 8 Oil Grabber In Laundry

*Lord Baltimore Uniform is an independently owned company based in Baltimore, Maryland. Owner and President Ken Gore, Jr. and his staff of 55 provide outstanding garment rental, linen, and dust control services throughout the Mid-Atlantic States. Lord Baltimore services*

# Implementing Oil Skimming Solutions

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*companies of every size throughout Maryland, Washington DC, northern Virginia, Delaware, and southern Pennsylvania.*

A large part of its commitment to excellence involves laundering a variety of items, including uniforms, linens, and mats. It currently processes around 2.34 million pounds of laundry per year, or approximately 9,000 pounds per workday. The 45,000 square foot laundry facility operates a single shift.

## **Cost and Compliance Challenges**

Lord Baltimore Uniform, as with all industrial laundries, is a water intensive facility, with a usage rate of 2,750 gallons per hour. Consequently, it must balance the escalating cost of water and wastewater services against increasingly stringent government regulations and the trend toward tighter TPH restrictions from wastewater treatment facilities.

Or, as Gore succinctly puts it, he was looking to “maintain profitability and growth while keeping 500 gallons of oil a year out of the Chesapeake Bay wastewater plants.”

## **Adopting the Abanaki Solution**

Charged with this formidable task, Gore began inquiring how other commercial uniform facilities were handling the challenge. The search led him to Abanaki Corporation, a national leader in oil skimming solutions.

“A member of our cost group had purchased an Abanaki oil skimmer and was pleased with the results. We were able to see one of the products in action, at Gallagher Uniform in Michigan,” Gore acknowledges.

He contacted the company and began working with an Abanaki sales rep to determine the best skimmer for their needs. They chose the Abanaki **Oil Grabber® Model 8** and installed it in October 2004. As a flagship product, the Model 8 is one of the company’s most dependable and effective means of removing oil from water and water-base solutions.

Designed to remove up to 40 gallons of oil per hour, the unit proved a good fit as a critical part of the water pretreatment system Lord Baltimore put in place. Like many laundries, the company operates a two-pit system: one for processing heavily soiled drain water and the other for clean drain water. In order to keep lint and solids from clogging the machinery, Lord Baltimore installed a baffled system over the 6000-gallon capacity heavily soiled pit, whereby laundry wastewater is pumped to an elevated station and run through a screen. The strained wastewater then flows into a holding tank where it is withdrawn by a feed pump. The Model 8 was installed in this tank, mounted near a clean water drain because it is here, where the liquid has sufficient dwell time, that the Abanaki unit can take advantage of the inherent tendency of oil and water to separate.

The Model 8 then utilizes a continuous belt and wiper to efficiently remove oil and other hydrocarbon contaminants from the surface. First the belt, operating on a motor and pulley system, runs through the wastewater.

Then it travels over a head pulley and through tandem wiper blades where oil is scraped off both sides of the belt and discharged. The tail pulley has flanges that allow it to roll freely on the inside of the belt without becoming dislodged. It requires no bearings and does not need to be mounted on the tank. If turbulent conditions exist, an optional tether and cage assembly prevents the tail pulley from being dislodged.

Depending on the characteristics of the liquid, the Model 8 has been known to reduce oil content to less than five parts per million in water. Although it is too soon to calculate exact results at Lord Baltimore, Gore anticipates the Abanaki unit will help manage overall operating costs as part of an efficient effluent management system.

For now, he sums up his current satisfaction with the Model 8 in just four words: “It does its job.”

# Implementing Oil Skimming Solutions

## Water & Waterbase Solution Treatment

**Oil Grabber® Model 4**

### Gallagher Uniform

## Midwest Leader Gallagher Uniform Uses Abanaki to Balance Stellar Service with Environmental Stewardship

*Since 1893, family-owned and operated Gallagher Uniform has provided a full range of uniform service options. Today, the company is set up to meet the needs of virtually every organization in south central Michigan that requires uniforms, from small operations of 10 employees to large enterprises with a workforce of 6,000.*

The four brothers who currently own and manage the business have over 100 years of combined experience. They put it all to good use, as witnessed by their outstanding track record—an incredible 99.35% customer retention rate. Recently, a national uniform rental consulting firm, Robert Swift & Associates, recognized Gallagher Uniform as having the highest customer retention rate ever recorded by one of their clients.

“We attribute our success to an ongoing commitment to deliver superior, ‘hands on’ customer service. We offer a 100% guarantee that our service will be exceptional and that we will be honest, fair and professional in everything we do,” acknowledged Dan Gallagher.

### A clean solution

The 30,000 sq. ft. laundry plays a key role in Gallagher Uniform’s dedicated approach. Through its continuous operation, the company is able to offer customers weekly laundering of soiled garments. The onsite facility also allows Gallagher Uniform to reduce rental costs by issuing previously worn garments whenever possible.

Like many laundry facilities, however, Gallagher has had to balance customer needs against increasingly stringent EPA compliance. Laundry plants can generate potentially hazardous wastes in the form of solvents such as petroleum. When local regulations began to tighten five years ago, Dan and his brothers began to investigate cost-effective ways to exhibit good environmental stewardship and still deliver timely, cost-effective laundry services.

They found the perfect solution in the Abanaki Corporation, a leading manufacturer of oil skimmers. As Dan recalls it, his brother Mike, who was then responsible for plant maintenance, discovered the company at an industry trade show in 2001. The Gallaghers have never looked back.

### The Abanaki Way

After contacting a sales representative and exploring all the options, they chose the Abanaki **Oil Grabber® Model 4**, one of the company’s most dependable and effective means of removing oil from water and water-base solutions.

“Gallagher operates a two-pit system. Heavily soiled drain water goes into one, and clean drain water into a second. The Model 4 is used in the heavily soiled pit, mounted near a clean water drain,” Dan revealed.

Oil skimming makes use of the differences in specific gravity and surface tension between oil and water, allowing the unit to attract oil and other contaminants from the water’s surface. The Model 4 utilizes a continuous belt and wiper action to remove up to 20 gallons of oil per hour from the surface. The belt, operating on a motor and pulley system, runs through the contaminated liquid to pick up oil. The oil is then scraped off both sides of the belt and discharged into 250 gallon holding tank. Every eight to ten months, the oil is properly emptied and disposed of offsite.

As with all Abanaki units, the Model 4 has a reputation for being easy to install and maintain. Dan concurs. “The Model 4 was easy to install. It’s easy to operate, and it requires minimal maintenance.”

# Implementing Oil Skimming Solutions

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More important, he says that the unit has done its job when it comes to regulatory compliances. An effective waste minimization program not only can reduce the costs, liabilities, and regulatory burdens of hazardous waste management, but it also can enhance community relations. Gallagher Uniform can attest to all these benefits, particularly when it comes to opening and strengthening the company’s relationship with the surrounding community.

“Abanaki has allowed us to build a good relationship with the city. Due to its effectiveness, we are now viewed as having taken a proactive stance with regulatory compliance. As a result, the city inspector relaxed limits and raised pH levels,” Dan added.

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## Machine Shop

### Coolant Maintenance

**Mighty Mini®**

### Anderson Screw Products

## Oil Skimmer Extends Life of Parts Washing Fluid and Ends Recontamination

*Like many metal working shops, Anderson Screw Products of Jamestown, New York turned to aqueous parts cleaning because of limits imposed by the EPA on the discharge of emissions and wastes.*

Anderson operates a 50,000 square foot plant with 65 machines, including a dozen or so parts washers - Magnus dip tanks filled with a mixture of water and cleaning compound. The cleaning compound utilizes and oil/water separation chemistry. But after three or four weeks, there was so much oil on the surface that parts were recontaminated when removed from the wash tank.

To solve this problem, Anderson installed a **Mighty Mini®** belt skimmer manufactured by Abanaki Corporation, Chagrin Falls, Ohio. The skimmer’s belt is operated by a motor and pulley system, which keeps it in motion whenever the unit is activated. The design uses the difference in specific gravity and surface tension between oil and water to pick up oil, grease and other hydrocarbon liquids as the belt passes through the washwater. After the belt passes over the drive pulley, it travels through tandem wiper blades where the oil is removed into a discharge channel. The oil then flows into a coolant saving Abanaki **Oil Concentrator®** where any residual water picked up with the oil is separated and sent back to the wash tank. The water-free oil is then discharged into a waste oil container.

The trial use of the Abanaki unit proved that oil skimming could extend the life of parts washing fluid by several weeks. The average time between fluid replacements is now three to four months. With this improvement, Anderson has quickly recovered the cost of the Abanaki Mighty Mini. Additionally, since installing the Mighty Mini into a small cavity in the tank’s cover, recontamination of washed parts has ceased to be a problem.

# Implementing Oil Skimming Solutions

## Coolant Maintenance

**Mighty Mini®**

### Hahn Manufacturing

## Reducing Those Troublesome Coolant Costs

### Hahn Manufacturing chose oil skimming to remove tramp oils and saved money in the process

*Hahn Manufacturing, a family-owned business, decided to skim oil, recycle coolant and help keep its part of the world cleaner.*

Hahn Manufacturing, located in Cleveland, Ohio, supplies precision prototype and production machined parts for OEMs across the country. The coolant tanks in Hahn's multiple machining centers were being contaminated with tramp oil. Plant manager Gary Ott was concerned with escalating disposal and replacement costs for the five machining centers. Coolant had to be replaced in the tanks every three months.

The **Mighty Mini®** oil skimmer looked as if it might fit the operation because of its ease of operation and compact size.

The Abanaki Corporation unit skims the floating tramp oil from the surface of the coolant and removes the oil at 1 gph by constantly rotating a stainless steel belt through the surface of the coolant sump, attracting tramp oils by breaking the surface tension of the coolant. The oil is then wiped off of the belt via tandem wiper blades and is discharged through a 3' discharge hose into a disposal container.

Access to the coolant sump is gained via the opening used for filling the machine sump. The built-in 24-hour timer permits the unit to skim oil when the machining center is not in operation, allowing the tramp oils to break out to the surface and be removed.

The oil skimmers paid for themselves in a few months. Hahn Manufacturing now runs the Mighty Mini® on its Okuma, Haas and Toyoda machining centers. Coolant costs have been reduced by 75 percent. The coolant stays clean and is replaced only yearly, saving the company time, money and coolant.

## Coolant Maintenance

**Tote-It®**

### Bobst Group

## Oil Skimmer Triples Coolant Life

### Removing Oil Cuts Machine Downtime, Extends Tap Life

*Any problem affecting the Ingersoll Master center in the Bobst Group's Roseland, NJ, machine shop can affect the productivity of the entire plant. The center, which has a 50 hp spindle and handles workpieces up to 3 m x 2 m x 1m, machines a variety of components for the Bobst Group's line of paper packaging equipment.*

According to Kit Payne, maintenance section manager, the machining center is a real workhorse. It runs two shifts a day, often operating for more than 20 hours at a time. Machining large plates and castings that require a lot of chip removal are all in a day's work. The machine can take a ½" deep x 8" wide cut at a rate of 40 inches per minute. In one operation, a six-ton casting is reduced to just five tons.

Just as the parts it machines are huge, so too are the center's coolant requirements. According to Payne, the center relies on an 800-gallon coolant sump. The steel tank measures about 5 feet square and 5 feet deep and is located within the machine's foundation beneath the shop floor.

When the machine was installed in 1994, the initial charge of coolant lasted several months. But after that, a charge would last no more than two months.

# Implementing Oil Skimming Solutions

“After we replaced the first charge, there was a drastic change,” Payne said. “The coolant really started to deteriorate quickly.” In addition to acquiring a rancid odor, it often became gummy. The machine also began snapping taps at a very high rate. “We wouldn’t get three holes out of them and they would break,” Payne said. The taps were especially vulnerable because the tapping operation requires the coolant to lubricate the tool in addition to dissipating heat.

## Why Coolant Goes Bad

The cause of the deterioration was a thin layer of oil which formed on top of the coolant while it was in the sump. Possible sources of the oil included way lube, minute leaks in the hydraulic system, and the natural deterioration of the coolant itself, in which the vegetable and mineral oils that make up the coolant separated from the water. The oil prevented oxygen from mixing with the coolant and allowed anaerobic bacteria to thrive. The bacteria then caused the coolant to break down even more.

## Coolant is Costly

Bobst’s first reaction was to replace the coolant. But the costs—along with machine downtime—quickly became a concern. Replacing and disposing of 800 gallons of coolant at about \$3 per gallon was expensive in itself. It also meant shutting down the machine for a full day while two or three maintenance workers drained the coolant, washed down the machine, recharged the system, and primed the pumps.

Losing the machine for a day was a big blow. “If you’re doing that every two months, that’s a lot of production time that goes down the tubes,” Payne said.

## Another Solution

Bobst then tried using a shop vac to suction the layer of oil off the coolant. “We noticed that the coolant was improving a little bit,” Payne said. “But, our oil consumption problem wasn’t going away. We were still using a lot of coolant because you wind up taking out a lot of coolant along with the oil. It’s self defeating.”

## A Solution That Works

At this point, Payne decided to install a **Tote-It Portable Oil Skimmer** with a 4-inch wide belt and an Oil Concentrator from Abanaki Corporation, Chagrin Falls, OH. The skimmer’s belt operates on a motor and pulley system attached to a stabilizer bar that is immersed in the coolant.

The Tote-It makes use of the differences in specific gravity and surface tension between the coolant and the oil. These differences allow the belt to attract oil from the surface of the coolant. After traveling over the head pulley, the belt passes through tandem wiper blades which scrape oil off both sides of the belt. The oil is then discharged through a 1¼” ID hose into the concentrator.

The concentrator utilizes gravity to separate the oil from the small amount of coolant that is picked in the skimming process. The separator ensures virtually complete oil/water separation, allowing the coolant to be returned to the system.

Since installing the skimmer system, Payne reports that a coolant charge now lasts at least six months. As a result, coolant replacement costs and machine downtime have been reduced, as has the cost of replacing taps. Based on the skimmer’s performance, Payne recently installed two Abanaki **Mighty-Mini® Portable Oil Skimmers** on the shop’s horizontal boring machine and vertical machining center.

## Coolant Maintenance & Recycling

## Oil Grabber® Model 8

### Lake Erie Screw Corporation

## Oil Skimmers Cure a Header Headache

*This Oil Grabber® Model 8 is one of five units that remove oily wastes from coolant at a major Cleveland bolt maker with the result that air in the plant is clean and clear without the dense smoke and haze that surrounded the bolt making machines in the past. The endless metal belt can be seen removing oil*

# Implementing Oil Skimming Solutions

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*clinging to it, pulling wastes from the tank of coolant over the drive pulley and past doctor blades that scrape the residue off both sides of the belt. Previously the lubricating oil, left in the coolant, emitted dense smoke and haze as it contacted the hot bolts in the trimming process. Skimming of the oil from the coolant permits recycling of the coolant for up to 90 days, and has resulted in virtual elimination of the smoke and haze problem at Lake Erie Screw Corporation, Cleveland. Abanaki Corporation manufactures the oil skimmers.*

Oil skimmers are being used in a major Cleveland bolt making plant to clean liquid coolant and clear the air, virtually eliminating the oil smoke and haze that are inherent in hot heading applications. The skimmers are equally efficient in less demanding press operations.

Lake Erie Screw Corporation installed the five skimmers – they are Abanaki models – to serve from one to seven headers each. Coolant from machines in each group is piped to a separate reservoir where the oil skimmer removes oily waste at a rate of 32 gallons per hour. The cleaned coolant is then recycled back to the machines.

Chief Engineer Chester Czerski defined the problem. Prior to the installation of the skimmers, each machine held its own light-weight coolant which combined with the machine lubricating oil seeping from oiled parts into the common reservoir. As the oily coolant was sprayed on the hot bolts in the trimming operation, the oil smoked, emitting a heavy haze which hung in the air around each piece of equipment. At times, on the larger machines, the visibility in the area was less than 10 feet.

Today the plant is virtually clear and clean, with a lower cost coolant undergoing continuous recycling for periods up to 90 days. Present coolants are 95 percent water and five percent soluble oil. Application of the coolant to the heated bolt in the trimming process produces virtually no emission. Lubricating oil which seeps from the machine into the reservoir combines with the coolant which is piped to the holding tanks where it is removed by the oil skimmers. The coolant is recycled after removal of the lubricating oil.

Operation of the Abanaki Oil Skimmer is based on the principle that oil is attracted to and will adhere to metal while other liquids will not. The skimmer's endless metal belt draws the oily wastes up out of the liquid being cleaned, over the head pulley and past doctor blades which remove the oily residue from both sides of the belt. The oil drains into a trough from which it flows to a collecting tank or drum.

A unique part of the Abanaki oil skimmer operation is the ability of the head pulley to drive the belt without interfering with the oily residue on both sides of the belt. A free-riding tail pulley stabilizes belt operation but permits it to bend around floating obstructions that might damage permanently secured equipment.

A typical Abanaki unit with eight-inch belt has the capacity to remove up to 32 gallons of waste oil per hour. With multiple belts, capacity can be increased to 160 gallons per hour. Because the endless belt is available in almost any length and the tail pulley is free riding, the unit can be furnished with various belt lengths depending on the height of the liquid to be cleaned and the height to which the removed residue is to be raised. Changes in liquid height do not affect efficiency of the skimmer.

The Abanaki oil skimmer is available with a nickel belt and with stainless steel construction. A heated model also is available for use in external applications where low temperatures tend to solidify oily wastes. The heated unit is particularly applicable to removal of any oil, grease or fat which tends to solidify at ambient temperatures. Other units are also available in special materials to withstand high alkaline or high acid solutions.

*Published in METAL STAMPING MAGAZINE*

# Implementing Oil Skimming Solutions

## Coolant Maintenance & Recycling

**Mighty Mini®**

### Z&Z Manufacturing

## Oil Skimmer Extends Coolant Life

### Clears machine shop's smoky environment

*Six months ago Tom Zovko, owner of Cleveland, OH-based Z&Z Manufacturing, a producer of hydraulic fittings and special screw-machine products, couldn't see across his 15,000 sq. ft. machine shop. The smoke generated by his CNC machining operations was not only polluting the environment but consuming much of his profits. That's when Zovko contacted Abanaki Corp. for a solution.*

Founded in 1980, Z&Z makes a wide variety of fittings for hydraulic pipe, hoses, and welding equipment. Products include British/metric fittings in steel, stainless steel, aluminum, brass, Monel, plastic, and various other castings.

The company's machines use way-lube oil to prevent rust and ensure smooth operation, and a coolant for easy cutting at high speeds. Engineers had just one problem: With the oil and coolant concentrated in the same area, the end result was a smoke-filled atmosphere that was unsafe for workers and violated EPA regulations.

### Beyond coolant changes

Zovko tried changing the coolant daily in an attempt to separate the lubricant from the coolant. This didn't work, and it cost Z&Z thousands of dollars in coolant, downtime and labor charges.

What to do? Try tested technology. Already successfully operating the Abanaki **Mighty Mini®** in his machine shop, Zovko decided it was time to add another. The skimmer's belt is operated by a motor and pulley system that keeps it in motion whenever the unit is activated. The design uses the difference in specific gravity and surface tension between oil and water to pick up oil, grease and other hydrocarbon liquids as the belt passes through the washwater.

The belt runs over a tail pulley connected to a stabilizer bar that is lowered into the washwater. After the belt passes over the drive pulley, it travels through tandem wiper blades where the oil is removed through a discharge channel. The 1" belt can remove up to 1 gallon of oil per hour from the surface of the water; the 2" belt can remove up to 2 gallons per hour.

### The trial

A test of the Abanaki unit proved that oil skimming could extend Z&Z's coolant for several weeks and could rid the shop of heavy smoke. "Abanaki brought in a demo unit, made suggestions on the most efficient way to use the product, and said if we weren't completely satisfied we wouldn't have to pay." Zovko tells MetlFax. "One week later I told them to send me the invoice."

The Mighty Mini weighs only 7 lbs., allowing it to be carried to different locations as needed. The unit, which has a footprint measuring less than 5" x 7", is quickly installed through a 2" diameter bung hole in a drum using an optional bracket.

"It's hard to say exactly how much oil the Mighty Mini is removing," Zovko says. "If there's a little oil in the machine, it's going to take out a little; if there's a lot of oil, it's going to take out a lot. If the Mighty Mini only removes 20 gallons per year, it's paid for itself."

Zovko adds, "Since installing the Abanaki unit, we've increased the life of our coolant and the life of our tools, saved on maintenance and EPA costs, and we have been able to breath a whole lot easier."

As its machine shop grows, Z&Z Manufacturing plans to add more Abanaki belt oil skimmers to the lineup.

*Published in METLFX*

# Implementing Oil Skimming Solutions

## Washwater Treatment

**Oil Grabber® Model 8**

### Lindberg Heat Treating Company, Rockford Division

## Oil Grabber® Model 8 Recovers 70% of Quench Oil

*There are eight oil skimmers such as this installed at the Rockford, IL plant. An oil skimmer for use on heated spray wash tanks in a Midwestern heat treating firm has enabled the company to recover 70% of their quench oil from the washing solution, materially aiding their energy conservation program.*

Recovery and recirculation of 70% of the quench oil is considered an exceptionally high level of efficiency according to Mr. James Reh, Plant Engineer for Lindberg Heat Treating Company, Rockford Division. He reported that the oil skimmers have become a vital step in the company's energy conservation program for recovery of oil previously discarded.

"In addition to saving more than two-thirds of the quench oil cost," Mr. Reh said, "Lindberg has saved countless hours of downtime formerly required to clean out their washer tanks every week. The tanks now run continuously for several months without requiring any maintenance." The Lindberg plant in Rockford, Illinois, has eight oil skimmers in operation on washer tanks. Their Norwood, Massachusetts plant uses three and there is one oil skimmer each at Lindberg's plants in West Allis, Wisconsin, and Minneapolis, Minnesota. All of the oil skimmers are equipped with 8" corrosion-resistant belts that remove up to 32 gallons of quench oil per hour each.

Operation of the oil skimmer is based on the principle that oil is attracted to and will adhere to metal better than water. The skimmer's endless metal belt draws the oily wastes up out of the liquid being cleaned, over the head pulley and past doctor blades which remove the oily residue from both sides of the belt. The oil drains into a trough from which it flows to a collecting tank or drum.

A vital part of the oil skimmer operation is the ability of the head pulley to drive the belt without interfering with oily residue on both sides of the belt. A free-riding tail pulley stabilizes belt operation but permits it to bend around floating obstructions that might damage permanently secured equipment.

Capacities of the **Oil Grabber® Model 8** range from 32 to 160 gallons of oily wastes removed per hour, depending on the number of 8" belts on the unit. Because the endless belt is available in almost any length and the tail pulley is free riding, the skimmer can be furnished to accommodate any height requirement, depending on the depth of the liquid to be cleaned and the distance the oily residue is to be raised.

The oil skimmer also is available in a heated model for use in external applications or anywhere low temperatures tend to solidify oily wastes, in any application involving removal of oil, grease, or fat which tends to solidify at ambient temperatures. Units are also available with belts of special materials to withstand high alkaline or high acid solutions (pH 1 to pH 14).

*Published in CHEMICAL PROCESSING MAGAZINE*

## Wastewater Treatment

**PetroXtractor®**

### Avedon Engineering

## Skimmer With Rolling Stand Helps Prevent Oily Water Discharge

*Avedon Engineering is a customized plastic parts manufacturer molding telephone, computer and other electronic equipment components in ABS, polycarbonate, polypropylene and foam-filled ABS. With production in two Longmont, CO buildings, the company operates 27 heavily used injection molding machines.*

# Implementing Oil Skimming Solutions

Despite continuous replacement and upgrading of fittings, it is difficult to entirely eliminate hydraulic and lubricating oil coming from machines during normal operations and maintenance activities. This oil ends up in different pits used to collect wastewater throughout the plant.

Because of high oil content, city officials would not allow plant wastewater to enter the Longmont sanitary sewer system. This meant that Avedon had to disconnect collection pits from sewer lines and contract with a hazardous waste disposal company to have wastewater hauled away at 32¢/gallon. Prior to pumping water out of the pits, a sample would be taken to determine if any solvent was present. If it was, the disposal cost jumped to \$575/barrel.

Faced with these high costs, Jerry Speckeen, Avedon’s Maintenance Manager, started looking for alternatives. The goal was to make the wastewater sewerable with a reasonable investment in equipment and operating costs. He found a solution in the **PetroXtractor®** made by Abanaki Corp., Chagrin Falls, OH.

This oil skimmer was originally designed for monitoring and remediation wells. It utilizes a continuous one inch wide skimming belt that fits into small openings on the collection pit covers. In operation, the skimmer removes up to three gallons of oil per hour.

Oil skimming makes use of the differences in specific gravity and surface tension between oil and water. These physical characteristics allow the continuous oleophilic belt of the skimmer to attract oil from the surface of the water. Speckeen also devised a rolling stand (which he calls the “I-V” stand because of its resemblance to those seen in the hospitals) in order for the unit to be used in more than one collection pit.

The skimmer is rolled to each collection pit where the belt assembly is inserted through the small opening in the steel lid and lowered into the water. The belt length is customized for the application.

The unit can operate anywhere there is a source of 115 VAC power for the fan-cooled fractional horsepower gear motor. The belt runs on pulleys with the head pulley attached to the drive motor and the tail pulley immersed in water.

During operation, the belt travels over the head pulley and through tandem wiper blades where oil is scraped off both sides of the belt. This oil flows through a discharge channel that can be connected to a hose. Speckeen designed the I-V stand so that it would straddle a 55-gallon drum used to collect the skimmed oil.

Although skimmed oil usually can be handled in the same fashion as automotive drain oil, Avedon is currently storing it with the intent to recycle. Samples have been sent to a testing lab to identify the type of contaminants present. Their findings will be used to determine the type of equipment required to process the oil and make it suitable for reuse in the hydraulic systems.

*Published in WATER & WASTE DIGEST*

## Wastewater Treatment

**PetroXtractor®**

### Rosemont Industries

## “Perfect” Finishing Operation Finds Perfect Solution to Combat Oily Wastewater

### Rosemont Industries Uses Customized Abanaki PetroXtractor in Black Oxide Operation for Cost Control and Compliance

*The origins of mass finishing can be traced to biblical times and the use of tumbling barrels. Today, vibratory finishing has emerged as one of the most popular finishing methods and manufacturers across a variety of metallic applications rely on leading providers such as Rosemont Industries in Cincinnati, Ohio.*

# Implementing Oil Skimming Solutions

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For decades, Rosemont has provided high quality metal finishing services at affordable prices to its broad base of local, national and international customers. The company's full range of vibratory finishing services includes new and refurbished equipment for deburring, edge breaking and polishing; media and compounds for parts separation and finishing; and a job shop for customized finishing work.

## The process of perfection

For those applications where the finish must be "perfect" – with no visible blemishes or defects – Rosemont offers a black oxide process. "Products known for their metallic luster such as costume jewelry and guns rank among the most popular end uses for black oxide finishing," Scott Majors, Rosemont's President of Operations, explains.

The process requires parts to move through several stages. First, they are polished in the facility's vibratory finishing system using ceramic media. After polishing, the parts go through an alkaline cleansing process followed by a counterflow rinse. This allows Rosemont to remove buffing compounds and manufacturing residue such as oils and grease. Next, the parts proceed into Rosemont's 68-gallon black oxide bath in the facility's 16-foot tank and then are run through ambient rinses. The final step is immersion in soluble oil that provides corrosion protection and enhances the appearance of the blackened parts.

## Escalating concerns

Although a black oxide finish is highly valued for its final results, the process has come under increasing scrutiny from regulatory bodies such as the U.S. Environmental Protection Agency (EPA). In recent years, the EPA has focused on service shops that use harsh chemicals, concerned that oily wastewater could find its way into local drinking water. Leading finishers like Rosemont have taken a proactive position as a result.

"We know we need to be particularly vigilant in how we handle the wastewater from the cleansing stage where oil and other contaminants are removed from the parts. The water flows through a batch discharge and mixes with wastewater from the entire plant, so we have to be sure tramp oil from this operation won't leak into any other area of operation or, of course, out into the surrounding community," Major says.

Majors also reveals that Rosemont needs to be mindful of the escalating costs associated with a shortened washer fluid life due to oils as well as the rising costs of disposing of the contaminated fluids.

## Finding the preferred solution

More than six years ago, the facility was able to use an internally designed and built skimmer to remove contaminants from the wastewater but as local and federal regulations tightened and costs began to skyrocket, Majors began to research other solutions. He found Abanaki, a worldwide leader in oil skimming solutions, through one of their customers.

"We had the chance to tour a customer facility and saw the Abanaki name on a skimmer in use there. They were quite pleased with its performance and said Abanaki was the best in the business, so we call the headquarters outside Cleveland and the company sent a representative down to meet us," Majors says.

According to Majors, the decision to call Abanaki was a good one. After analyzing the operation and discussing Rosemont's specific needs, the decision was made to install the belt-driven oil skimmer the PetroXtractor,

In general, belt oil skimmers work because of the differences in specific gravity between oil and water which causes oil to float to the top of the water where it can be removed. The special belt material breaks the surface tension of the water to attract and collect the floating oil. The belt passes through a set of wiper blades via a motorized head pulley where the oil is wiped off both sides of the belt. The oil then flows through the skimmer troughs and into a proper disposal container.

# Implementing Oil Skimming Solutions

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## Making the best better

The **PetroXtractor** by Abanaki Corporation offered Rosemont several unique advantages over other choices. Its single unit design separates oil and elevates it up to 100 feet without a pump. It has a tethered tail pulley to prevent accidental belt loss, and it is designed to skim very little water, even with fluctuating water levels. This was an important consideration at the facility, since levels fluctuate often, with different shifts handling different production capacities.

In addition, factors such as variable pH levels and the use of rust inhibitors – both present at Rosemont – can affect a skimmer’s ability to pick up oil and may require a specific skimming medium.

“Very early on, we experienced some problems with the belt as we often use some very harsh chemicals,” Majors acknowledges. “But all we had to do is call Abanaki and they sent someone down right away to assess the situation. Then they customized the belt material to fit our needs. All in all, the service response was excellent.”

## Good for costs - and compliance

Low initial cost and even lower maintenance are two common benefits of an Abanaki skimmer. The only required maintenance is replacing a belt and wiper blade set as needed and there are no filters to change. And the **PetroXtractor**, while boasting a pick-up rate of up to 16 gph, requires very little operating space with no tank modification.

“We have been very pleased with the Abanaki unit. It consistently pulls the right amount of material we need to stay in compliance and takes up very little room. From the time it was installed over six years ago in a corner of the plant, it hasn’t required any special attention and it works great,” Majors concludes.

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## Paper Mill

### Wastewater Treatment

### Oil Grabber® Model 4

### St. Joe Container Corporation

## Oil Skimmer Pays Off for Paper Mill

*Skip Hogue is maintenance manager at St. Joe Container Corporation, a paper mill and converter in College Park, GA that produces about 100 tons of corrugated boxes each day.*

Hogue noticed excessive oil in the wastewater discharge from boxboard operations. This oil comes from the rolls and bearings on the corrugating machines, and ends up in the plant’s drainage system. Drainage water empties into a three-stage collection pit that has a system of three weirs for skimming and decanting the fluid before water is allowed to enter the city’s sewer lines. An oil skimmer in the second stage pit wasn’t performing satisfactorily and oil was ending up in discharge water.

It wasn’t long before Hogue replaced the old skimmer with Abanaki’s **Oil Grabber® Model 4**.

Hogue’s skimmed oil is picked up by an oil recycling company. The company’s policy is that they do not charge for pick up if there isn’t a lot of sludge in the oil that requires pretreatment before processing. Hogue says, “That could be a problem... because cardboard scrap and starch from the production process ends up in the plant’s drainage water. So we purchased the Abanaki unit with their optional decanter, which has a screen to remove sludge and provides a final separation stage... the unit has been running for months without attention.”

Hogue adds, “Since installing the Abanaki unit, we haven’t had to pay to have our waste oil hauled away, and College Park sewage treatment officials are happy with the quality of our water discharge.”

*Published in POLLUTION ENGINEERING*

# Implementing Oil Skimming Solutions

## Power

Emergency Spill Containment

**Oil Grabber® Model MB (Multi-Belt)**

### **Blenheim-Gilboa Pumped Storage Power Project**

## **Detecting Leaks and Removing Oil**

### **New patent behind Abanaki Oil Skimmer helps protect Catskill Mountain hydroelectric site**

*The Blenheim-Gilboa Pumped Storage Power Project, which operates at the Mine Kill State Park in New York's Catskill Mountains, relies on Abanaki's Oil Grabber Model MB oil skimmer to detect leaks and remove oil from sumps.*

Upon demand, the Power Project can generate hydroelectric power quickly—up to 1,040,000 kW within just two minutes. Water is discharged into a lower reservoir adjacent to the 650-acre state park that was built by the New York Power Authority and is run by the Saratoga-Capital Region of the State Office of Parks, Recreation, and Historic Preservation.

The Project's pumped storage is a closed cycle, with the same water used again and again. During periods of low power demand, the water is pumped back into the upper reservoir. No fossil or nuclear fuels are used, eliminating their related environmental considerations.

Because the power generation process uses large hydraulic systems to control water flow, it is conceivable that a failure in the hydraulic circuit could cause a hydraulic oil leak, which would result in an accumulation of hydraulic oil and water in a sump at the lower elevation of the plant. The Abanaki **Oil Grabber® Model MB** provides a reliable and effective means for detecting the leak and removing oil from the sump.

The skimmer is mounted above the sump at a location that is frequented by operating personnel. If oil is present, it adheres to the belt in the sump and is removed from the belt at the higher elevation where it is observed. The source of the leaked oil is then located and repaired. The collected oil is removed for disposal, and clean water is discharged into the lower reservoir.

Recently, the U.S. Department of the Interior honored the New York Power Authority with its highest outdoor recreation award for the varied conservational, recreational, and cultural facilities developed by the Authority as part of the Blenheim-Gilboa Power Project.

Abanaki Corporation is proud to count the Blenheim-Gilboa Pumped Storage Power Project among its customers. Headquartered in Cleveland, Ohio, Abanaki is the world leader in oil skimming solutions for virtually any application. For more than 30 years, the company has served a global customer base in industries as diverse as iron and steel, wastewater, paper, food processing, automotive, environmental remediation, and recycling.

Emergency Spill Containment

**Oil Grabber® Model 8**

### **Blenheim-Gilboa Pumped Storage Power Project**

## **Oil and Water Don't Mix**

*Small spots of motor oil on your driveway look tacky enough. Leaks of hydraulic oil from the hydro turbine of a big pumped-storage plant are not only more noticeable, but they also could end up in the facility's sump or in its reservoir, as well.*

At the Blenheim-Gilboa Pumped Storage Power Project in New York's Catskill Mountains, there's another reason leaks are unacceptable. The New York Power Authority (NYPA), which built and operates

# Implementing Oil Skimming Solutions

the facility, recently received the U.S. Interior Department’s highest outdoor recreation award for its stewardship of an adjacent 650-acre park that the NYPA built in conjunction with the project.

Upon demand, Blenheim-Gilboa can generate hydropower quickly up to 1,040 MW within just two minutes. When demand peaks, the “plant” is put into service by emptying water from an upper reservoir into a lower one. During off-peak periods, the same water is pumped back to higher elevation.

NYPA’s solution to the potentially embarrassing leak problem was to add an **Oil Grabber® Model 8** from Abanaki Corp. (Chagrin Falls, Ohio) to the facility’s sump to detect and remove floating oil before it reaches the lower reservoir. The skimmer is mounted above the sump at a location that is open to inspection. Any oil in the sump adheres to the belt and is removed by wipers and discharged to a drum. The presence of oil on the belt is easily observed by operators. The belt skimmer provides early and reliable leak detection and removes the oil from the sump.

*Published in POWER MAGAZINE, September 2003*

## Emergency Spill Containment/Prevention

**Oil Grabber® Model 8**

### South Feather Water and Power

## South Feather Water and Power Underscores Commitment to Clean Water, Efficient Power with Abanaki

### California Utility Installs Model 8 Oil Grabber in Power Plant

*The mission of South Feather Water and Power (SFWP) is two fold: to provide cost effective power with minimal impact on the environment; and to ensure a dependable supply of safe, quality drinking water as well as a reliable supply of water for agricultural users. In all instances, the California-based utility is committed to delivering water and power in the most economical, efficient and publicly responsible manner. It also is dedicated to providing its employees with a safe work environment.*

These commitments led SFWP to proactively seek out one of the industry’s best solutions for guarding against oil leaking into the water supply.

### The Abanaki Alternative to Messy Sorbents

SFWP Electrical Maintenance Supervisor John Davis is responsible for the maintenance of the hydroelectric generation facilities. “Old generators have a tendency to leak oil, which can end up in the sump. Obviously, any discharge into the reservoir is unacceptable, so we’re always on the lookout for a proactive solution,” he said.

Davis witnessed what he thought was an excellent solution at Pacific Gas & Electric (PG&E) and was impressed. They had installed an Abanaki **Model 8 Oil Grabber** at a powerhouse to prevent oil from leading into the water supply.

“I started looking for an alternative to the method we had been using to remove oil from sump-- sorbents. While they can be effective, they’re also very messy and time consuming, so I started searching the Internet for oil skimmers,” Davis explained. In his search he found the Abanaki website and discovered more about the **Model 8**.

Today this device is mounted in a key power facility. Its continuous belt and wiper action makes use of the differences in specific gravity and surface tension between oil and water. The belt, operating on a motor and pulley system, runs through contaminated liquid to pick up oil from the surface. After traveling over the head pulley, the belt passes through tandem wiper blades where oil is scraped off both sides of the

# Implementing Oil Skimming Solutions

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belt and discharged into an Abanaki **Oil Concentrator**. From the oil concentrator any residual water is returned to the sump and the oil is sent to a 55 gallon drum.

## Low Maintenance Benefits of the Model 8

The Abanaki Model 8 Oil Grabber is designed to be a dependable and effective means of removing oil from water and water-base solutions, up to 40 gallons of oil per hour from the fluid surface. It is considered a good choice for applications with fluctuating water levels as it can be used in tanks with depths as shallow as one foot, or as deep as 100 feet.

How is it working at South Feather Water and Power? In use now about a year, Davis revealed that the Model 8 has been a welcome addition by his staff.

“The maintenance department really likes not having to manually remove oil. They no longer have to check on the sump as often or take the time out of routine maintenance checks to manually clean it,” Davis explained. He also reported that the **Model 8’s** low maintenance design has been well received.

The tail pulley has flanges that allow it to roll freely on the inside of the belt without becoming dislodged. It requires no bearings and does not need to be fastened to the tank. If turbulent conditions exist, an optional tether and cage assembly prevents the tail pulley from being dislodged.

“We’re a small staff with a large area to cover. The Abanaki oil skimmer in place gives us one less thing to worry about, ” Davis concluded.

## Refinery

### Wastewater Hydrocarbon Removal

**Oil Grabber® Model MB**

#### Montana Refining

## Leading Oil Refinery Underscores Compliance and Cost-Effective Commitments with Abanaki

### Montana Refining Installs Model 5×8 Oil Grabber MB in Wastewater Treatment System

*The world’s first oil refineries came into being in the mid 1800s to recover kerosene from crude oil. Gasoline was merely a waste byproduct. The automobile age changed all that, particularly in the United States, where refinery demand shifted significantly to the primary refined products of today – gasoline and diesel. Two world wars also increased the need for sustainable fuel sources for war ships.*

Strict legislation has since mandated that refineries meet stringent air and water cleanliness standards. In fact, obtaining a modern building permit for a refinery with minimal environmental impact is so difficult that no new refineries have been built in the United States since 1976. To keep up with demand – as well as to stay cost-effective – many facilities have expanded and the industry is rife with mergers and acquisitions.

Such is the case with the Montana Refining Company, a 10,000-barrel a day crude oil refiner purchased by world leader Connacher in March 2006. Like other large-scale plants with high capacity, process optimization and advanced process controls are very desirable at Montana Refining.

As Stephen Kind, a Reliability Engineer at the Montana Refining Company for the past 18 years puts it, the company’s number one goal is “to produce fuels as economical and environmentally friendly as possible.”

# Implementing Oil Skimming Solutions

## How to Recapture 100% Hydrocarbon

Montana Refinery is a very sophisticated plant capable of producing everything from gasoline and jet fuel to asphalt. So when Kind went looking for a reliable method of capturing and transferring oil from the plant sewers before sending water to the city's wastewater facility, he went on the Internet. That's where he found Abanaki.

Abanaki Incorporated is the world's leading manufacturer of oil skimmers, an efficient and cost-effective solution favored by wastewater engineers across industries for many years. The skimmer lends itself perfectly to wastewater collection and treatment systems designed to ensure that water running through the plant is suitable either for reuse or disposal.

Kind chose the Abanaki **Model 5x8 Oil Grabber MB** to replace a manual method. It was the unit's reputation for removing relatively large amounts of hydrocarbons that appealed to Kind.

Prior to implementing the Abanaki skimmer, hydrocarbons had been skimmed using an adjustable horizontal slotted pipe that was rolled by hand. Overtime, operating costs were increasing due to the labor-intensive requirements of these kinds of methods, becoming further compounded by the amount of water recovered that must then be treated or disposed of as hazardous waste.

Oil skimming makes use of the differences in specific gravity and surface tension between oil and water. These physical characteristics allow the Oil Grabber to attract oil and other hydrocarbon liquids from the surface of the fluid efficiently and cost effectively. Kind further ensured that oil would be removed at high rates by choosing a version of the unit that is built specifically for jobs requiring high capacity oil removal. The 5x8 version features five belts made of Abanaki's patented **Fuzzy Belt®** material. Not only do the multiple belts deliver eight skims simultaneously, their revolutionary material was patented by Abanaki to offer exceptional oil skimming performance on light, non-viscous hydrocarbons, such as gasoline diesel, and jet fuel, where rate of recovery is an important factor.

As a result, the continuous belt and wiper action of the Model MB 5x8 removes up to 200 gallons of oil per hour from the fluid surface. The belts, operating on a motor and pulley system, run through the contaminated liquid to pick up oil from the surface. After traveling over the head pulley, the belts pass through tandem wiper blades where oil is scraped off both sides of the belts and discharged.

"We recapture 100% of all hydrocarbons that go down our drains," Kind confirms. "The sewer systems of the refinery go to a collection pit where we have the skimmer mounted. The skimmer collects the hydrocarbons and they are sent back to our crude tank."

## More Multi-Belt 5x8 Marvels

Abanaki also designed the unit to be an easy install without tank modification and with virtually no maintenance issues. The tail pulleys have flanges, which allow them to roll freely on the inside of the belts without becoming dislodged. They require no bearings and do not need to be fastened to the tank. If turbulent conditions exist, an optional tether and cage assembly prevents the tail pulleys from being dislodged in almost any depth, from a shallow one-foot up to 100 feet.

"We leave the skimmer on 24/7. If we can't transfer the oil for some reason we open a by-pass valve and let the oil go back to the pit until our secondary containment pit can be pumped," Kind says.

"The system is a great time saver. Operations doesn't have to baby-sit the skimmer. Since time is money, I believe the cost of electricity is more than off set, not to mention that less water is transferred to our break tank with the belt skimmer," he adds.

In fact, everything about the Oil Grabber MB Model 5x8 is designed to last for many years. With proper configuration it can handle liquid temperatures up to 212°F, and the pH of the fluid can range from 3 to 13. The skimmer drive includes an oil filled gear reducer with bronze gears and ball bearings. The motor, reducer, and powder-coated finish of the weldments give the unit an exceptionally long life, even under the harshest conditions.

# Implementing Oil Skimming Solutions

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“Everyone seems to be impressed with the process. There has been no maintenance on it since we leveled it and deflected the inlet from impinging on the belts. Bart Eggert, (Abanaki’s Regional Account Representative) was very responsive to our questions and extremely helpful in trouble shooting any installation problems we had.” Kind concludes.

## Steel Mill

### Wastewater Treatment

**Grease Grabber®**

#### WCI Steel

### Creative Skimmer Solution Endures Environment and Reduces Costs

*WCI Steel, a steel manufacturer in Warren, Ohio, needed an uncommon solution to a fairly common problem—removing grease and other contaminants from their outdoor circulating water system. They turned to Abanaki Corporation, Oil Skimmer Division in Chagrin Falls, Ohio for the answer.*

Each week, WCI Steel uses 200 gallons of grease on a roll out table to keep steel slabs from rolling off the caster. Much of this grease is washed into a 40,000 gallon outdoor interceptor pit by cooling water sprayed on the newly poured slabs. If grease isn’t removed before filtering, the system’s sand bed quickly becomes clogged.

Before turning to Abanaki, Bob Gregory, supervisor of caster water treatment for WCI Steel, tried several methods of grease removal with little luck. He was looking for a custom-designed skimmer that required minimal upkeep.

Abanaki provided Gregory with the **Grease Grabber®**, a state-of-the-art skimmer that makes use of the differences in specific gravity and surface tension between oil and water. This allows the skimmer belt to attract grease, oil and other hydrocarbon liquids as the belt passes through the surface of the water, even under the most turbulent conditions.

Abanaki customized several skimmer features to meet WCI Steel’s unique needs. The belt length was modified to ensure the belt surface stays in contact with the 14 ft. of pit water, even at its lowest level. A heavy-duty drive was used to ensure the belt and drive assembly will elevate skimmed grease from virtually any tank depth. CRV wiper blades were beefed up to more effectively remove grease in cold temperatures. What’s more, Abanaki increased the pulley shoulders of the belt to keep it centered, even when subjected to twisting caused by turbulence. Finally, a number of features were designed-in to meet WCI Steel’s low maintenance request.

According to Gregory, “With the current design, we have a system that works and it survives in our outdoor environment ... By protecting our sand bed filter, it pays for itself.”

*Published in 33 METAL PRODUCING*

# Implementing Oil Skimming Solutions

## Wastewater Treatment

**Tote-It®, Oil Grabber® Model 4**

### Allegheny Ludlum Corporation

## Allegheny Ludlum Uses Abanaki to Support World-Class Wastewater Treatment Standards

### Model 4 and Tote-It® Installed at Key Sump Station Areas

*Allegheny Ludlum Corporation is a world leader in the technology, production and marketing of specialty materials – from stainless and silicon- electrical steels to titanium, nickel alloys and other advanced alloys. Its customers represent diversified consumer and capital goods markets in more than 30 nations.*

In keeping with the company's ISO 9001-certified quality system, the leader goes well beyond traditional business measurements to balance bottom-line efficiency with service excellence and a commitment to quality. Nowhere is this balancing act more in evidence than in the company's industrial wastewater treatment facility in New Bedford, Massachusetts.

Chief Wastewater Operator George Bergman's responsibilities encompass the restrictions on wastewater from regulation and corporate accountability practices with the need for quality water and a mandate to contain the overall cost of treatment.

### Sump Station Savings

Like most manufacturing or processing facilities, Allegheny Ludlum employs a collection system by which rinse water is collected before being transferred to the wastewater treatment system. Chemical residue floats on the surface of the tanks, oil drops to the middle while water is near the bottom. This continuous settling wastewater treatment process enables the company to reuse a high percentage of the liquid recovered from the production line – an important consideration as the quality water so necessary for industrial processing becomes harder and increasingly more expensive to obtain.

As Bergman points out, the savings start with "the effective removal of oil from the wastewater sump stations prior to treatment in the wastewater facility." Yet as he and his three-man crew of wastewater operators discovered, hand skimming using absorbent pads was an inefficient and ultimately costly method.

Looking "to reduce the time and labor associated with manually removing the oil with absorbent pads during our daily checks of the system," Bergman discovered Abanaki Corporation, a leading manufacturer of oil skimming solutions in the country.

Bergman first became familiar with the national leader by word of mouth and did further research on the company's website.

### Belt-driven Benefits

He chose two of the company's most popular models: the Abanaki **Oil Grabber® Model 4** and the **Tote-It® Portable Oil Skimmer**. Both skimmers rely on the differences in specific gravity and surface tension between oil and water to be effective. These characteristics allow the skimmer belts to attract oil and other hydrocarbon liquids from the fluid surface quickly and efficiently with little water content – a key factor in reducing the cost of disposal and lower the contingent liabilities of wastewater discharge.

Each system also delivered specific benefits for specific areas of the treatment facility.

Ideal as a pretreatment before filtration, Bergman requested the installation of the Model 4 in a sump that collects water from several furnace wash tanks and used to remove oil. He and his team "inspect the process daily to ensure that the Model 4 Oil Grabber is working properly, check the condition of waste oil drum and inspecting and cleaning the wiper blades."

# Implementing Oil Skimming Solutions

He reports the unit operates quite well.

The Model 4 removes oil at a rate of up to 20 gallons of oil per hour through a continuous belt and wiper action. The belt, operating on a motor and pulley system, runs through contaminated liquid to pick up oil from the surface. After traveling over the head pulley, the belt passes through tandem wiper blades where oil is scraped off both sides of the belt and discharged.

Bergman had Abanaki's most mobile unit, the Tote-It, installed in a floor sump to remove oil from floor washing" – an ideal setting for this 36 lb portable unit that requires no modifications to mount and maintains skimming efficiency in fluctuating fluid levels.

In fact, low maintenance and self-running sufficiency were key reasons Bergman chose Abanaki in the first place. As he explains, "I chose the Abanaki products for their simplicity of operation and automatic features, such as operation timer and shut off switch when the waste oil drum is full."

Now, after six months in operation, Bergman reports that the two units have yielded even more benefits. "We have saved on labor and time by not having to apply and remove the oil absorbent pads every week," he says.

Further, Allegheny Ludlum's maintenance and wastewater operators are impressed with its ability to remove oil and simplicity. Maintenance Technician Bob Zussy, who installed both units, commented on the simplicity of the units, noting to Bergman that they were easy to install and delivered a high quality of the workmanship, from the way the parts lined up to the quality coating.

Excellence in quality, price and delivery are key elements in Allegheny Ludlum's standing as a worldwide producer of specialty metals. A commitment to world-class production standards also necessarily involves operating an effective and efficient wastewater treatment facility. By installing Abanaki oil skimmers at key areas of the treatment process, the company underlines customer satisfaction, ensuring a residue-free product, and underscores community stewardship, providing proactive environmental protection measures.

## Wastewater Treatment

**Grease Grabber®**

### North Star Steel

## Grease Skimmer Conquers the Most Demanding Interceptor Pit

*North Star Steel, a seamless pipe mini-mill in Youngstown, Ohio, needed a cost-effective, low maintenance solution to oil and grease contamination of their descaling water system, including the sand beds filtering this circulating water.*

During a day's operation, up to 100 gallons of oil and grease from open gears, drive chains, bearings and other sources get washed into wastewater flumes by cooling water. The flumes carry the water to concrete interceptor (descaling) pits located below grade and upstream of the sand beds. The flow rate of the system is about 10,000 gallons per minute.

Over the years, Dave Giancola, plant maintenance engineer at North Star Steel, has tried floating booms, floating suction (pump) skimmers and moving media in the form of tubes and mops to remove the oil and grease—all with no success.

Giancola then turned to Abanaki Corporation, Oil Skimmer Division in Chagrin Falls, Ohio for a solution. After analyzing the situation, Abanaki's belt style oil skimmer, the **Grease Grabber®**, was recommended and tested at North Star Steel. The Grease Grabber makes use of the differences in specific gravity and surface tension between oil and water. This allows the belt skimmer to attract grease, oil and other hydrocarbon liquids as the belt passes through the surface of the water, even under the most turbulent conditions. Because of the skimmer's sleek construction, it was easily installed on the catwalk at the edge of the mill's final interceptor pit.

# Implementing Oil Skimming Solutions

According to Giancola, “At first, our personnel were skeptical that the Grease Grabber’s smooth belt could really pick up oil and grease. However, it wasn’t long before they were seeing it remove 400–500 gallons of oil and grease a week from the interceptor pit.”

The only maintenance required has been routine cleaning of the unit’s wiper blades, a procedure that takes about 20 minutes a month.

## Technology Solutions

### Wastewater Treatment

**Chiperator®**

### FMC Technologies, Inc.

### Portable Coolant-Cleaning Unit Increases Efficiency

*Maintaining a regular and systematic method of cleaning shop sumps and coolant can be an important step in maximizing the efficiency of manufacturing operations. Machining processes can dirty coolant over time, contaminating the fluids with tramp oil, chips and swarf. If left unattended, this can cause problems such as increased downtime of entire systems, slower cycle times and more tool and equipment replacements. Contaminated coolant also can contribute to an unsafe work environment by creating smoky conditions, an unpleasant odor and increased chance of contact dermatitis among susceptible workers.*

For Jay Wilson, facility engineer at a Stephenville, Texas-based plant within the FMC Technologies, Inc. (FMCTI) family, these issues are all too familiar.

Since 1976, Mr. Wilson has handled the heating, electrical, ventilation and air conditioning (HVAC) and other operational needs for the plant.

FMCTI, a global provider of technology solutions for the energy industry and other industrial markets, employs approximately 11,000 people and operates 33 manufacturing facilities in 19 countries. The company designs, manufactures and services systems and products such as sub sea production and processing systems, high-pressure fluid control equipment, measurement solutions and marine loading systems for the oil and gas industry. Additional work includes food-processing equipment and specialized products for the aviation industry.

Keeping coolant clean is a priority at FMCTI, which says outstanding Health, Safety and Environment (HSE) performance is a core value. Lines running along designated columns throughout the Stephenville plant deliver coolant from a central tank to each machine. The facility regularly cleans the coolant by pumping it from sumps, removing common contaminants and rinsing the systems with water before recharging them with reclaimed or new coolant. Mr. Wilson’s team had been using coolant carts with diaphragm pumps to return the coolant after cleaning, but it needed a more efficient method. Mr. Wilson concluded that adding a sump-cleaning vacuum would make the entire process run more efficiently. After doing some research, he settled on the Abanaki **Chiperator®**, which acts as both a vacuum and a pump. The air driven unit vacuums old cutting fluids from machine sumps and separates chips, swarf and muck from the liquid. After straining the unwanted solids, the unit pumps the coolant back to the sump. It is able to strain 40 gallons of coolant per minute, and it can drain or refill its 55-gallon drum in less than 2 minutes.

Now, coolant carts at the FMCTI facility incorporate the Chiperator along with a return diaphragm pump for additional pumping capacity. One important benefit, Mr. Wilson says, is that the entire cleaning system is on rollers for easy access. Without a portable solution, the shop would have to permanently station several coolant-cleaning devices at each machine sump. In addition, the Chiperator features disposable filter bags for easy cleanup. With no moving parts to malfunction, the unit is also easy to

# Implementing Oil Skimming Solutions

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maintain. A float valve automatically shuts the unit off when the drum is full, and an automatic pressure relief valve is included for safety. An on/off valve also offers easy shutoff.

According to Mr. Wilson, the unit is more efficient than the previous system. He also comments that shop personnel find it easy to use. "The guys that work with it like it," he concludes.

*MODERN MACHINE SHOP, February 2008*

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## Transportation—Auto Recycling

Wastewater Treatment

**Oil Grabber® Model 4**

**Albert Looms**

### An Easy Option for Collecting Oil

*Albert Looms recently purchased an oil skimmer to collect the oil from their interceptors and drains.*

Having previously used a saucepan with a long handle, the idea of a machine being able to do the work for them seemed quite appealing. Albert Looms' Operations Manager, Ray Kirk explained, "Removing the oil was one of those jobs that has to be done but is time consuming and no one really wants to do it. When we saw the oil skimmer we did have our doubts as to how effective it would be but this machine really has lived up to all our expectations." He continued, "We check the interceptor once a week and the drains on a daily basis. If we need to remove any oil, we drop the belt in and let it run. It couldn't be simpler."

Looms' skimmer was supplied by Abanaki UK Ltd., who manufactures a range of models to suit different applications. The model shown is the **Oil Grabber® Model 4**, which can separate oil at a rate up to 20 gph and lift up to 100 ft without the need of pumps. The unit will maintain skimming efficiency with a fluctuating fluid level and can be used in depths as shallow as one foot.

If you think a skimmer could make your life easier, you can contact Abanaki on 01179 616679 or visit their website at [www.abanaki.co.uk](http://www.abanaki.co.uk)

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## Transportation—Boat

Wastewater Treatment

**Tote-It®**

**Devall's Fleeting Service**

### Portable Skimmer Fits the Bill

**Removes Oil Residue from Engine Cleaning in Southern Climate**

*Research on the World Wide Web led an employee of Devall's Fleeting Service to the website of the Abanaki Corporation. A tug boat and barge company located in Hackberry, Louisiana, Devall's was interested in steam cleaning their engines but needed a way to deal with the oil residue that the process would leave. While considering different proposals for oil separator systems, Devall's decided to contact Abanaki for information regarding their solution for oil removal problems—the patented Abanaki oil skimmer. "We told them what we needed to do and they recommended a system," explained Mike Devall, Jr., "they really helped us."*

# Implementing Oil Skimming Solutions

Abanaki recommended the **Tote-It Portable Oil Skimmer**. This single assembly unit is a dependable and effective means of removing oil from water and is especially well suited for parts washing. Oil skimming works on the principle of surface tension. Oil and other hydrocarbon liquids are picked up as the belt passes through the surface of the contaminated liquid. After traveling over the head pulley, the belt passes through tandem wiper blades where oil is scraped off both sides and discharged.

Devall now steam cleans their engines in a large concrete tub that collects the run-off water. The waste is then pumped into a 500 gallon holding tank located outside of its facility. The Tote-It—designed to last for many years under the most severe conditions—has been installed on top of the tank. Recovered oil is discharged into 55 gallon drums and then hauled away by a local oil company. They have probably pulled off 300 gallons of oil in a year. “We set it up, plugged it in, and turned it on,” states Devall’s Engine Repair Facility Manager, Mike Devall, Jr. “It’s been doing the job ever since.”

Devall’s Fleeting Service is very happy with their Abanaki Tote-It. The skimmer runs between 25 and 30 hours a week and has not required any maintenance or adjustment since its installation a year and a half ago. The fact that “there is not one speck of rust” on the skimmer in spite of being out in Louisiana weather has only added to their very positive impression of the product.

In search of the perfect oil removal solution for their engine steam cleaning process, Devall’s Fleeting Service decided to invest in the Abanaki Portable Oil Skimmer, Tote-It. They feel the Abanaki Corporation could have “fooled them and demanded thousands of dollars more” for their patented design. Other proposals under consideration would have “cost much more and taken up more space.” They are very happy with their choice. “I know it’s worth the money,” explains Mike Devall, Jr. and adds that the **Tote-It** is a solution for oil removal he would easily recommend.”

## Wastewater Treatment

### Oil Grabber® Model 4

## USS Great Lakes Fleet

### Great Lakes Fleet Improves Oily Water Separation with Skimmer, Planning

*Periodic cleaning of engine room equipment is part of the USS Great Lakes Fleet preventative maintenance program. To do a thorough job, it involves the use of cleaning compounds which dissolve lube oil and grease.*

Carl Walker, engineer–maintenance planning at USS Great Lakes Fleet, specifies these compounds, and one of his major concerns is what happens when they enter the bilge water – as he also has to ensure that the fleet’s oily water separators reduce the oil content of bilge water to a negligible amount, even in the presence of these chemicals. As Mr. Walker said, “Separators need help in the form of auxiliary equipment, and they benefit greatly from planning that considers the type of cleaning compounds used.”

The company has found an oil skimmer to be a piece of auxiliary equipment which greatly enhances the performance of an oily water separator. In many separators, filter element efficiency is affected by oil concentration in the water being processed. By reducing floating oil before it gets into the separator, the equipment performs more efficiently and filter elements last longer. The cost of the skimmer is quickly repaid through reduced element replacement cost and less time spent giving special attention to monitoring and reprocessing water whose oil content remains high.

On many USS Great Lakes Fleet bulk carrier vessels, Mr. Walker has installed an oil skimmer made by Abanaki Corp. of Chagrin Falls, Ohio, which helps reduce oil content of bilge water before it gets to the separator. The Abanaki **Oil Grabber® Model 4** specified by Mr. Walker uses a stainless steel belt operating on a motor and pulley system. This design makes use of differences in specific gravity and surface tension between oil and water to pick up grease, oil and other hydrocarbon liquids as the belt passes through the water. The unit can remove up to 20 gallons of oil per hour.

# Implementing Oil Skimming Solutions

Still, peak skimming efficiency can more quickly be achieved through good installation practices, and by being selective in the types of cleaning compounds used. For example, some cleaning compounds have emulsifiers which help loosen oil and grease, but subsequently may cause the oil to form a tight emulsion in the bilge water.

## Transportation—Rail

### Wastewater Treatment

**Oil Grabber® Model MB**

### Union Pacific Railroad Wastewater Treatment Plant

### Breaking Endurance Records

#### Abanaki Multi-Belt Oil Skimmer still going strong after 22 years service at a Chicago wastewater treatment plant

*Jose Ceballos is Supervisor of a Union Pacific Railroad Wastewater Treatment Plant that handles the waste stream from a large locomotive cleaning shop in the heart of Chicago. He recently shared his experience with Abanaki as to how he has helped UPRR get the most out of its Oil Skimmer. First and Foremost he is proud of the record of clean water the plant has achieved for more than 20 years. By local law, treated water can contain no more than 200 ppm (parts per million) of suspended solids, oils, hydrocarbons, etc. to be allowed to go back into the city system. The return stream is carefully and consistently tested daily for proper pH levels and ppm. Mr. Ceballos' test reports, which are kept and checked by the City of Chicago Water Authority, have always been less than 10 ppm of all pollutants combined. The plant has had an Abanaki Multi-Belt, 4-Belt Skimmer system mounted on the main concrete treatment tank since 1976.*

Initially, a lot of experimentation was needed to get the Oil Skimmer working right, and Mr. Ceballos found that most problems could be solved by simply following the manufacturer's instructions to the letter. By using the exact type and grade of lubricating oil specified for the motor and gear reducer for instance, he was able to stop premature wear on the bearings and gears. By adjusting the mounting tilt of the oil skimmer and the hanging angle of the belts, he was able to reduce friction and wear on the drive rollers and belts to nearly zero. Says Mr. Ceballos, "I didn't want to have to be always repairing the skimmer by replacing worn out parts that were overburdened, not lubricated with the right oil, not set correctly, or matched with the right mating parts for this application. I made the proper modifications to relieve strain on the Oil Skimmer in order to make the skimmer system work the way it was designed to with the least amount of maintenance. Machines and systems are like everything else on earth—just like the human body. If you take care of the properly, let them work in their natural way, they will last a long time and serve you well."

Mr. Ceballos says that the best feature of his original **Multi-Belt Oil Skimmer** was the material used in the manufacture of the belts. Because of the harsh and varied nature of the chemical makeup of the wastewater coming off the diesel locomotives, (heavy grease, lubricating oils, fuel, sand, dirt, chemical cleaners, and soaps), a high quality poly composition was used on the first belts. Also chosen for their "oleophilic" surface, that is, their affinity for picking up a heavy film of oil from the surface of the water, each belt is 8 inches wide, about 8 feet in length, and are the original belts. They have been in service every day since 1976 and have NEVER BEEN REPLACED. They remove an average of 100 gallons per hour of oils, grease, diesel fuel, cleaners, and sludge from 65,000–75,000 gallons of waste wash water per day. The wiper blades, made of oil resistant material, remove the oil and channel it into a pumping system specially designed and installed to allow the oil skimmer to skim at its maximum volume without overflowing. The waste products ultimately go to an underground holding tank where further separation

# Implementing Oil Skimming Solutions

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of oil (to be recycled), grease, water, and sludge for final disposal occurs. He lets “birds nests and beaver dams” (small amounts of light debris) build up around the wipers. Instead of constantly removing all the unsightly but harmless debris, Mr. Ceballos has discovered that it makes an excellent protective cushion for the wipers (also originals) and extends their working life. He has never replaced them either.

Abanaki found out about this impressive performance and maintenance record when Mr. Ceballos suggested to the UPRR management that they order another similar system. For a new wastewater treatment plant planned for another rail yard. At first, because he had not been in contact with Abanaki Corporation for years, (a result of not having to replace any parts other than the motor contact brushes) he thought the company might be no longer in business. He was happy to find that, although having long since moved to a new location, the original manufacturer of his Oil Skimmer was very much alive and well in the same general location. In planning the order for the new **Multi-Belt Oil Grabber®**, he talked to Ruth Crowle, in sales at Abanaki and provided this impressive case history: “The Abanaki Multi-Belt Oil Skimmer is still going strong. With the right maintenance, I think it could still be working in 2098!”

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## Tube Manufacturer

Process Cleaning Tank

**Tote-It®**

**A Precision Metal Tubing Manufacturer**

### **Belt Skimmer Improves Quality Control**

*To a precision metal tubing manufacturer producing a product that meets precise tolerances is not good enough. Keeping customers satisfied also means the tubing must be free of any residue from various chemical solutions used during fabrication.*

Having a wide variety of customers, their products can be found in many applications from automobile rocker arms and cam shafts to lawn and garden equipment, and as magazine tubes on rifles and shotguns. For each application, a close tolerance, clean, residue-free tube is delivered.

Keeping the tubes free of chemical residue is challenging. After arriving at the plant, the stock is degreased and placed in a dip tank containing sulfuric acid. It is then coated with zinc phosphate, drawn, machined and degreased a second time in a sodium hydroxide solution. Finally it is neutralized in an alkali bath and protected with a synthetic oil coating to prevent rust.

The combination of oil, water and chemical residue presented a unique challenge. It is critical that the chemical residue does not move downstream from one dip tank to another. During the process, chemical residue floats on the surface of the tanks, oil is in the middle and water on the bottom.

To remove the residue, employees would hand skim the tanks when the plant was shutdown on weekends. Hand skimming was messy, time-consuming, costly and inefficient. It never allowed for an effective separation of the oil and the chemicals. It was not possible to recycle “clean” oil back into the process.

Looking for an alternative, the decision was made to install the **Tote-It® Portable Oil Skimmer** from Abanaki Corporation on a trial basis. The Tote-It utilizes a continuous belt and wiper to remove up to 12 gallons of oil per hour from a liquid’s surface.

The 4” wide belt operates on a motor and pulley system. The system is attached to a stabilizer bar that is immersed in the liquid. After traveling over the head pulley, the belt passes through tandem wiper blades where oil is scraped off both sides of the belt. The oil is discharged through a 1¼” ID hose.

The skimmer’s effectiveness rests in the differences in specific gravity and surface tension between oil and water.

# Implementing Oil Skimming Solutions

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These characteristics allow the belt to attract oil and other hydrocarbon liquids from the fluid surface.

Because of the Tote-It Portable Skimmer’s success, the decision was made to buy two of Abanaki’s **Oil Grabber® Model 8** Skimmers with 8” wide belts. These units operate on the same principle as the Tote-It Portable Skimmer, but have the capacity to remove up to 40 gallons of oil per hour.

The switch from manual to mechanical skimming resulted in immediate benefits. Dip tanks were cleaner with much less residue carry-over from tank to tank. This eliminated the need for weekend overtime for hand skimming. Material costs and downtime also reduced, since the oil is recycled longer and tanks need to be drained and refilled much less often. Finished product quality has improved, resulting in greater customer satisfaction.

Today the tube manufacturer has earned ISO 9000 certification. The mechanical oil skimmers have played a key role. The skimmers have become an important part of the plant’s quality control process.

## Utility

### Wood Treatment Creosote

**PetroXtractor®**

#### Texas Electric Cooperative, Inc.

## Towering Trees to Preserved Poles, Texas Electric Cooperative’s Wood Preserving Division Maintains Environmental Integrity With Abanaki

*Early in the 1940s, the electric cooperative in Texas formed Texas Electric Cooperative, Inc., an association that was to supply certain activities that were common to their collective goal of providing the lowest cost electricity to rural areas of Texas. The Association and its divisions, as well as the cooperatives themselves, are owned by the people who receive their power from their individual cooperatives and all operate as a non-profit organization.*

### Quality by design

One of their interests was the ability to supply preserved utility poles for the construction of new lines to these rural customers. To that end, they purchased a wood preserving plant in Lufkin, Texas. This facility was closed in 1964, and a new, more modern facility was built at its present site in Jasper, Texas. Randy Dorman, Technical Services Manager for the Jasper facility explained, “Our goal at this facility is to supply the member owners with the highest quality pole on the market while maintaining the lowest cost and maintaining the smallest environmental fingerprint that we can make. That is the Association’s goal for today and the future.”

Quality poles are selected by TEC’s professional foresters in the woods. The poles are cut and trucked to the facility where they are debarked, cut to length, framed and preserved. The poles pass through a rigorous inspection process by both plant personnel and third party inspection agents. Once the poles are approved by all the inspectors, they are loaded onto trucks and shipped throughout Texas to the respective electric cooperatives.

### A compromising challenge

Prior to 1985, TEC used surface impoundments to treat their wastewater from the plant. However, due to enactment of regulations by EPA, TEC had to abandon the use of these impoundments and start a State approved closure. The impoundments were closed in the early 1990s, and monitoring of various wells on the site indicated that the integrity of one of the earliest constructed impoundments had been compromised. During the monitoring phase, it was discovered that DNAPL had appeared at one of the monitoring wells. DNAPL is dense non-aqueous phase liquids; in other words, the liquid coming to the well has a

# Implementing Oil Skimming Solutions

higher specific gravity than water and remains at the bottom of the well. “TEC knew early on the material problems due to the type of product being recovered and lift problems due to the depth of the DNAPL. The company worked with us diligently to resolve the problems in short order,” Dorman said.

Dorman chose the **PetroXtractor**, a popular choice for well applications. As a belt-driven skimmer, the PetroXtractor was designed to attract floating oil in the well. The Abanaki device also offers unique features that greatly enhance its oil removal capacity and overall efficiencies. The PetroXtractor’s bearing-less tail pulley design, for example, uses its tethered frame to perform three important functions while immersed in the well water: it keeps proper tension on the belt, prevents accidental loss down the well, and keeps the belt centered in the casing.

Abanaki worked with Dorman to understand fully the application, and subsequently reconfigure the unit. Abanaki even made modifications to the PetroXtractor to ensure it would work optimally for TEC. First, its polymer belt was switched to a backed belt that wouldn’t stretch due to the oil’s chemical properties. Next, weight was removed from the tail pulley and stainless steel rods were added to keep the pulley close to the bottom of the well. A more powerful motor was installed once it was determined that the faster speed would not emulsify the oil. The pulley material itself was eventually changed in order to resolve chemical compatibility problems incurred over time.

The Abanaki PetroXtractor has been in continuous operation at the treatment plant site since August 2000. The Treatment Division, which maintains stringent environmental standards throughout every phase of its operation, has been pleased with the PetroXtractor’s performance. According to Dorman, “We have found that the equipment is almost maintenance free and has the capability to operate in the automatic mode.”

Abanaki may play a role in the Division’s future quality assurance plans.

“Currently we only have one system operating at this facility, since that was all that was required. However, we are considering the installation of five to seven of these units at a site that we had previously owned. The site is about 60 miles from our main facility, and we would only dedicate about six man-hours per week to it, mainly to monitor levels of product recovered. The easy installation and maintenance of the Abanaki skimmers will be especially important for such a remote site,” Dorman concluded.

## Wastewater Treatment

## Oil Grabber® Model 4

### Bridgewater Effluent Treatment Plant

### Well Oiled Machines

*On November 1, 2004, Bridgewater’s first oil skimmer began removing oil from its mill drains. At a cost of \$6,500, the skimmer, supplied by Abanaki UK Ltd, represents a significant investment and underlies Bridgewater’s commitment to enhancing the operation of its Effluent Treatment Plant.*

The acquisition of an **Oil Grabber® Model 4** materialized following lengthy periods of under performance from a primary Krofta flotation clarifier earlier in the year. Average daily oil losses of 200 liters per machine, the majority of which was making its way to the drain, had begun affecting the operating efficiency of the Krofta which uses a blend of chemicals and entrained air to coagulate and float solids. The drop in solids removal (primarily fiber and filler) at the primary Krofta had resulted in a higher loading and increased strain on a secondary treatment process. On top of its negative effect on the Krofta’s operation, some oil was actually getting through to the secondary system, where it was an ideal food source for several varieties of filamentous bacteria. With such a plentiful food source, the bacteria can spread quickly and wreak havoc with sludge settlement rates within the secondary clarifier.

Diagnosing what was affecting the Krofta efficiency wasn’t that straightforward, mainly because there are a number of chemicals on site that have the ability to affect operation. After numerous checks of all the chemical systems on site, and many hours spent ensuring that the Krofta was mechanically sound, the only option was to conclude that the problem was caused by excessive oil drainage.

# Implementing Oil Skimming Solutions

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Oil to drain is nothing new but the primary plant's main drain pit (which feeds the Krofta) has always been a collection point for coal dust, grit, oil, and other debris. Although the volume of oil to drain was not overly higher than normal, the pits capacity had been reduced somewhat with the gradual build-up of rubbish. The oil was therefore not being allowed to float in the pit but was instead being pulled into the pumps and fed direct to the Krofta. Oil being a natural defoamer and its presence in the Krofta's feed water, was counter productive towards achieving the desired solids floatation, when the air was added later in the process.

Several attempts were made to remedy this problem including eliminating or reducing oil leakage, and capturing as much oil as possible at the source, which meant installing containers and collection drums in the key areas of oil loss under all machines. Another solution was to clean the main drains pit to increase its capacity, thus allowing the oil to enter the pit, float, and remain on the surface, rather than being dragged into the pumps. Lastly, was to hold back or "trap" the oil before it reached the Krofta, which was done quite successfully using a piece of old felt wrapped around a wooden pallet.

When each of these solutions proved to be inadequate, the final step was to test a device that was capable of removing large quantities of oil. An Internet search provided numerous possible solutions, one of which was an oil skimmer.

The trial unit was a belt skimmer design, consisting of a 4" polymer belt running between two pulleys, one submersed below the water line, and a scraper to remove the oil. The skimmer works on the basis that most oils are lighter than water and therefore float. The oils disliking for water means it will quite happily bond with the skimming medium, in this case the polymer belt, which allows it to be skimmed off and captured. The water's lack of affinity with the polymer belt means that virtually no water is picked up.

The trial proved to be a real success with daily capture rates of up to 600 liters. The one negative was the belt's tendency to come loose from the pulley during high flows. On ordering a similar model to the trial unit, a cage was also purchased to prevent this from happening.

The skimmer is currently working well. At the rate it's going, the skimmer should pay for itself in just over a year.