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**Contaminated Soil Remediation**  
**Brownfields and**  
**Oilfield Wellhead Services**

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## **Acknowledgment**

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## Summary

BME Environmental (BME) has the availability of mobile "Soil Recycling and Remediation Equipment" to remove hydrocarbons, kerosene and other contaminants from soil on-site. BME is in the business to provide a service for contaminated soil and water remediation.

The soil remediation equipment can process a range in throughputs of 30 tons to over 300 tons of contaminated soil per hour.

The smallest unit is called the "Eureka 30" and to date this machine has been used to successfully treat over 10,000 tons of soil and closed 5 sites. This site R & D provided ideal "real world" data to design and manufacture our multi-sized full production units. We have now increased the output of our smallest unit, the "Eureka 40" to 40 tons per hour and is a 4 wheel self-propelled unit.



A key objective of the equipment for the remediation process is the ease of setup and use. The processor is easily moved to and around a project site, and it will work successfully with almost any size loader. Below you can see the "Eureka 40" next to a medium sized "Bobcat" loader.



## **Soil Contamination Problems**

Don't worry. The answer is simpler than you realize. We are specialists with effective and affordable technologies for cleaning up contaminated soil.

We don't haul off the contaminated soil to a landfill, or try to bury it on your site. Those are yesterday's "solutions." Instead, we harness proven soils processing tools with advanced bio-gradable chemical and biological remediation application, to reliably treat and neutralize the contamination itself - without destroying the usability of the soil. Therein, the contaminated soil is treated onsite, including at oil field wellheads - straight from the well to our mobile unit and is treated before it touches the ground. Treating onsite saves the client transportation costs.

The system is versatile. The system will treat virtually any type of contamination problem, in any type of soil condition. The system works on your site. Set up takes minutes, not hours or days. Processing is fast -- faster than any other proven decontamination system in widespread commercial use today.

Each system is designed to help obtain real relief from actual and contingent liability for your contaminated soil.



BME will undertake soil recycling and remediation projects throughout Canada and United States, specialized contaminants (non-radioisotopes) and large volumes (i.e., in excess of 7,500 cubic yards/ 10,000 tons).

### **Basic Configurations and Specs**

BME's three basic configurations are based on a similar structural platform, which has been specifically designed for easy transport by trailer or for loading into a standard 20 foot shipping container for long distance deployment. In addition, all configurations are powered by Perkins diesel-powered engines, which provide power for the soil processing mill - where steady, reliable power is key to thorough treatment of embedded contamination.

All configurations include self-propelled, radio remote-controlled movement (i.e., forward/reverse) and steering. In addition, certain configurations include (standard or extra-cost option) an operator station near one end of the hopper for optimal control and supervision of system operation.

BME's three basic machines use a 4-wheel configuration for enhanced maneuverability. Our largest capacity machine comes with dual loading stations, perfect for those large projects that require greater maneuverability.

Larger capacity machines come equipped standard with a larger hopper opening, in order to accommodate use of big capacity front-end loaders. All configurations come with a speed-adjustable main conveyor system for transporting contaminated soil from the hopper to the soil processing mill. In the our largest capacity machines, speed adjustment can be performed

from the operator control station without having to stop operations.

Except for the Eureka, all configurations come either standard or optional with a second conveyor for attachment beneath the soil processing mill. This conveyor makes it possible to deposit remediated soil in stacks up to eight feet high (six feet for the Coloma). The Empire comes with two conveyors that are equipped for radial movement, making it possible to build remediated soil stacks to the side as well as to the rear of the processing mill.

The soil processing mill in all configurations comes equipped (standard or extra-cost option) with a Star Wheel bar in addition to the main processing wheel. This design allows the processing mill to operate efficiently in even the most difficult soil conditions and compositions. In the larger capacity machines, this Star Wheel comes equipped (standard or extra-cost option) with its own hydraulic drive system to further boost operating efficiency.

All configurations include multiple remediation fluid injection systems (either dual or triple). This makes it possible to inject more than one remediation treatment formulation (chemical or microbial) into the soil at the same time, or to provide a higher proportional volume of a single formulation, as required for a given contaminant situation.

Finally, the larger capacity configurations come with an optional "built-in" system for measuring the weight of soil being processed. This makes it possible to accurately track throughput and processing totals by weight rather than, or in addition to, standard volume measurements.

For a list of the different units that BME uses for soil remediation, see Figure 1. For a list of the contaminants that can be removed from soil, see Table 1.

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**Please, Recycle and Reuse!**



	MODEL SR40	MODEL SR80	MODEL SR160	MODEL SR320
Rated capacity	40 ton/hr	80 ton/hr	160 ton/hr	320 ton/hr
Operating dimensions (not including second conveyor)	16' long 6' 10" wide 6' 8" tall	16' long 6' 10" wide 6' 8" tall	19' long 6' 10" wide 6' 8" tall	40' long 6' 10" wide 10'6" tall
Length of main hopper	8 ft	8 ft	11.5 ft	11.5 ft dual
Engine model	Perkins	Perkins	Perkins 1104D	Perkins Dual 1104D
Rated HP max. / continuous	35 / 30	58 / 50	125 / 110	250/220
Drive system(s)	Dual hydraulic	Dual hydraulic	Dual hydraulic	N/A
Wheel configuration	4 wheel	4 wheel	4 wheel (4 wheel drive optional)	8 wheel Stationary
Soil Trac	N/A	N/A	Optional	N/A
Self-propelled	Standard	Standard	Standard	Standard
Remote controlled movement	Standard	Standard	Standard	Standard
Remote controlled steering	Standard	Standard	Standard	Standard
Conveyor system / adjustment control	Hydraulic / Remote Control	Hydraulic / Remote Control	Hydraulic / Remote control	Hydraulic / Remote control
Separately controlled remediation fluid injection systems	Single / Dual	Single / Dual	Multiple / Triple	Multiple / Triple
Processing mill configuration (dual includes Star Wheel)	Dual	Dual	Dual (separate Star Wheel drive optional)	Dual includes separate Star Wheel drive
Attached second conveyor (for deposit of treated soil)	N/A	Optional	Standard	Radial version available
Onboard operator station	N/A	N/A	Optional	Standard
Onboard digital soil weight measuring system	N/A	N/A	Optional	Optional
Trailer mount transportable	Standard	Standard	Standard	F3D Wheel HD
20 ft. shipping container transportable	Standard	Standard	Standard	Self Contained on 40' flatbed

## Soil Remediation Equipment Specs & Sizes



**Oilfield Wellhead Mobile Remediation Service Unit**  
**Processes 60 Tons Per Hour**

**FIGURE 1**

## TABLE 1

### Contaminants that can be Removed from Soil

Acetates, Acrolein, Acrylonitrile, Alcohols, Aldrin, Aliphatic Solvents, Alkylamine Acids, Ammonia, Anthracene Sub Compounds, Anti-Freeze, Aromatic Solvents, Arsenic (soluble), AV Gas

Benzene, BTEX/BTX, Bunker "C", Burner Fuel Oil (ASTM)

Cadmium (soluble), Carbon Tetrachloride, Chlordane, Chloride, Chlorinated Compounds, Chlorinated Phenols, Chlorinated Solvents, Chlorobenzene, Chlorofluorocarbon, Chloroform, Chlorohexane, Chloronaphthalene, Chlorotoluene, Chromium (soluble), Chromium (hex to tri) Chrysene, Citronellol, Cobalt (soluble), Copper (soluble), Creosols, Cresote, Crude Oil, Crude Oil Sludge, Cutting Oil, Cyanide

Dichlorobenzene, Dichloroethane, Dichloroethylene, Dichloropropane, Dichlorotoluene, Diesel Fuel, Di-limonene, Dimethylene Glycol, Dinocytophthalate, Dioxane, DNAPL, DNT

Endrin, Ethers, Ethylbenzene

Fluorene, Fuel Oil, Fuels

Gas Condensates, Gasoline, Gas Plant Distillates (MGP) Glycols, Grease

Halogenated Volatile Organic Compounds, Halogenated Semivolatile Organic Compounds Heating Oils, Herbicides, HSVOC, HSVOC's, HVOC, HVOC's Hydraulic Oil

Ionized Metals (soluble), Insecticide, Isoprenoids

Jet Fuel, JP 4, JP 5, JP 8 (standard), JP 8 AV/Turbine

Kerosene, Kepone, Ketone, Ketones

Lead (soluble), Limonene, Linalool, LNAPL, Low End Petroleum Hydrocarbons, Lubricants, Lubricating Oil

Methyl Ethyl Ketone, Methyl Naphthalene, Methylene, Methylene Chloride, MGP, MGP Waste, MGP Distillates

MIL-F 16884 H, MIL-H-17672D, MIL-H-19457D (fire resistant), MIL-H-23699,

MIL-H-5606, Mil-Spec- #2-#6 Fuel Oil, Mil-Spec-2190 TEP MIL-L-17331H,

Mil-Spec-9250 L 06 MIL-L-900H, Mil-Spec-ANSI/SAE J1899-95, Mil-Spec-D 369S,

Mil-Spec-DF-1 Low Temp, Mil-Spec-DF-2 General, Mil-Spec-DF-A Arctic,

Mil-Spec-DFM (fuel Marine), Mil-Spec-F-44, Mil-Spec-F-76 Diesel, Mil-Spec-JP-4,

Mil-Spec-JP-5/JP-8 standard, Mil-Spec-JP-7, Mil-Spec-JP-8 aviation/turbine,



Mil-Spec-Naval Distillate Fuel (NDF), MIL-T-56 Turbine Fuel, Mineral Spirits,

Motor fuel, Motor Oil, MTBE

NAPL's, Naphthalene, Nitrate, Nitrite, Nitro-aromatic explosives (TNT,DNT,RDX),  
Nonhalogenated Semivolatile Organic Compounds, Nonhalogenated Volatile Organic  
Compounds, NVOC, NVOC's

Oils and greases, Organic Herbicides, Organic Pesticides, Organic Hydrocarbons

PAH's, Paint Thinner, Paraffin, PCB, PCE, PCP, Pentachlorophenol, Perchlorate, Pesticide-245-T,  
Pesticides, Petrol, Petroleum Fuels, Petroleum, Petroleum Hydrocarbons, Petroleum Sludge,  
Phenanthrene, Phenols, Phenoxy Acetates, Phenyl Ureas, Polycyclic Aromatic Hydrocarbons,  
Propylbenzene

RDX (Explosive Nitroamine)

Sludges, Stoddard Solvents, Soluble Metals, Styrene, SVOC, SVOC's, Sodium

Tars, TCA, TCE, Tenacious Thick Hydrocarbons, Terpene compounds, Tetrachlorethane,  
Tetrachloretylene, Toluene, TNT, TPH, Transmission Fluid, Trichloroethylene

Vinyl Chloride, VOC's

Xylene

Zinc (soluble)



**POST TREATED SOIL**