

CONTROLLED RECOVERY INC.

CLOSED LOOP SOLIDS HANDLING SYSTEMS

Controlled Recovery Inc. is an oilfield disposal company that has been in business since 1991. During this time we have seen a marked trend for oil producers to be more in tuned to the environment and have worked tirelessly to improve their impact on surface lands and ground water. The most obvious and lasting impact during drilling operations are, of course, the reserve pits. The utilization of closed loop drilling systems will eliminate this problem.

Reserve pits, while convenient, present several risk and cost factors. The risk factors include leakage through liners, overflow, personal injury, wildlife impact, and area exposure. The costs associated with pits include excavation, lining, increased location size, fencing, dewatering post TD, encapsulating solid waste, and either burying or removal of solid waste. The most potential for cost is the long term liability a producer will incur with the use of these pits. Utilization of a closed loop drilling system will eliminate or reduce this potential liability.

We at Controlled Recovery (CRI) have developed a system that efficiently manages drilling waste in a clean, controlled manner. Originally closed loop programs incorporated a type of steel pit that required a backhoe to scoop drill cuttings from the steel pit and deposit them into a dump truck. This technique caused some what of a mess by the cuttings overflowing from the backhoe bucket while transferring the cuttings. Once the cuttings were loaded into the dump truck there was often leakage from the truck during the transfer to a disposal site. This has lead to shutdowns of drilling operations when the Oil Conservation Division has received complaints of this contamination. Problems and operations such as this spurred CRI into action.

We use a track and sealed bin set-up to collect and transport these cutting with no spillage or further contamination. The tracks come in three pieces of 30 foot sections that are connected by use of pins. When connected this track system is 90 foot in length. We assemble these sections behind the steel mud pits using either a fork lift or a boom truck. They are spotted with consideration of where the shell shaker is situated and where the centrifuge and de-watering system are to be located. This track system is very low profile to allow for the bins to be located as low as possible. When the rail system is situated we align and unload two bins for collection of cuttings. The track system allows for two bins to be on the rails at the same time. This allows for unloading into one bin and when it is full we pull it forward while moving the empty in its place to allow for continuous filling with cuttings in a smooth transition. These bins are loaded and unloaded with roll-off trucks. Our track system is designed for loading and unloading from either end depending on the particular rig and location. The bins we use have a capacity of twenty cubic yards and are sealed to allow for fluid containment if needed. This means that during pickup operations there is no leakage of cutting or free fluids. When we pickup a loaded bin we also install an empty bin so that there are two bins on the rails at all times.

The tops of the bins open by sliding doors. This allows maximum opening to facilitate the dumping of solids into the bins from the shale shaker slides, the centrifuge, and other de-watering units that may be used during the closed loop process. While we do not provide or operate solids control equipment we have worked closely with all the service companies to minimize any problems with these combined operations. We also recommend the use of a diaphragm pump to keep as much free liquid pumped off of the bins as possible. This fluid is re-circulated back into the mixing tanks for further use. We have these pumps or the drilling rigs will provide them if needed. We also incorporate the use of a “bin mover” to pull full bins forward if a roll-off truck is not on location. This device is a winch setup on a dolly system powered by batteries attached to the dolly.

There is a general misconception that a closed loop drilling program is vastly more expensive than a conventional pit program. Given the correct circumstances a closed loop system could be much less expensive. Several factors that determine the cost of a closed loop system are, depth of well, size of hole, length of drilling time, and of course the proximity to a disposal facility. The following are some actual cost incurred by various producers:

Well A } 32 miles from our facility; well drilled in 18 days; 324 cubic yards of cuttings; 9622 foot TD; Total cost of CRI **\$19321.26**

Well B } 56 miles from our facility; well drilled in 27 days; 546 cubic yards of cuttings; 12,923 foot TD; Total cost of CRI **\$24588.38**

Well C } 188 miles from our facility; well drilled in 20 days 144 cubic yards of cutting; 4964 foot TD (we ran closed loop system on long string with oil-based mud only); Total cost of CRI **\$18244.15**

Well D) 18 miles from our facility, well drilled in 14 days, 402 cubic yards of cuttings; 8796 foot TD; Total cost of CRI **\$15112.84**

Typically, solids control equipment costs approximately the same as our total charges. This includes the centrifuge, de-watering system, and personnel. Consequently, when a typical pit is dug, lined, de-watered, and closed out, it is not much if any more costly to incorporate the closed loop system. The elimination of possibly long term liabilities associated with pits is, to coin a phrase, **Priceless**.