



Editorial Feature

NORMs contamination treatment using Ivey-sol technology

NORMs (naturally occurring radioactive materials) are found almost everywhere, and many natural materials, such as the earth's crust, contain such radioactive materials.

So what happens when oil and gas activities such as petroleum refining and natural gas extraction, disturb such radioactive material? They can alter the natural background radiation — the radiation that we are naturally exposed to on a day to day basis — causing radioactive waste to be brought to the earth's surface.

Usually, the background level in Western Canada and the United States is in the neighbourhood of 60-80 CPM (counts per minute). While radioactivity in oil and gas production and processing equipment is of natural origin, estimates suggest that up to 30 percent of domestic oil and gas wells may produce some elevated TENORM (Technologically Enhanced Naturally Occurring Radioactive Material) contamination.

It is believed that the enhanced technology being employed in today's oil and gas industry is, in part, responsible in the rise of NORMs contamination. When identifying NORM contamination, any consistent reading at or over double background is considered a NORM contaminate.

Once at the surface, NORM contaminants present many challenges to oil and gas companies. Since the radioactive waste can accumulate on drilling and processing equipment, NORMs-contaminated equipment can have a significant impact on maintenance and inspection.

Companies must also ensure there is no risk to workers and must employ radiation experts to ensure proper handling and disposal of NORMs. Presently there are only guidelines and regulations that pertain to the disposal of these contaminants. The guideline states that a contamination level of 70 KBq/Kg (or Litre) may be transported off site to disposal. Since NORMs waste is considered a HazMat, the cost of disposing the contaminated sludge is in excess of \$250/ton.

Solution

George Ivey, founder and CEO of Ivey International Inc., recently teamed up with Terry Timothy, manager of Environmental Services for Key Safety Services Inc., to test his Ivey-sol technology on NORMs-contaminated equipment. Key Safety incorporates the Ivey-sol technology in their remediation process.

The Ivey-sol technology is based on the encapsulation of the radioactive contaminants. One end of the molecule from the Ivey-sol mixture is attracted to the target contaminant or the radioactive compound. Once enough of these target contaminants are attached to the Ivey-sol mixture, they are basically "pulled" into the solution and made soluble. "The technology can be used on any type of solid material, such as filters, pipelines, sludge, soils, even clothing," says Ivey. "We tested it on a piece of pipeline that was over 20,000 becquerels and safely brought it down to below 200 becquerel."

Ivey-sol technology has a proven ability to decontaminate radioactive contaminated materials regardless of contamination type or level, to levels appropriate for handling and or transportation in accordance with national and/or international guidelines.

"The solution used at the correct percentage in conjunction with the proper temperature and application system is very effective," explains Timothy. "We have been able to take contaminated inlet filters both fibre and aluminum and paper-combination types and treat them with starting counts per minute of 580 CPM and cleaned them to background, which is 100% clean."

Advantage

A huge advantage of the Ivey-sol technology is the ability to decontaminate NORMs-contaminated equipment on-site. Costly plant shutdowns can occur while equipment is being decontaminated, and some equipment such as filters or PIGS must be sent away for cleaning and disposal. "There are a number of items such as valves



The concentrations that precipitate out in sludges and as scale on internal services of oil and gas production and processing equipment may vary in thickness from a few millimetres to more than an inch.

and piping that are stored in isolated bone yards awaiting a proactive way of dealing with them, we believe our system is going to help bring a proactive solution," says Timothy.

"There's obviously a lot of benefits to being able to perform an on-site treatment, versus a company shutting down their system, packaging their contaminated equipment, transporting it to a NORMs disposal facility to have it decontaminated and then shipping it back," says Ivey. "We can take contaminated sludge, soil, filters and sections of pipelines and literally treat them on-site from start to finish in as little as 15 to 20 minutes in some cases. So the technology is relatively fast."

To the marketplace

At present, there is enough information to show there has been a continual growth in NORMs contamination. We do know that

the technology in today's oil and gas industry is, to some degree, responsible for the contaminants that we are seeing present day.

"There's an element of concern among major oil companies; they want to resolve the NORMs issue so that it is safe for their staff," says Ivey. "But there doesn't appear to be too many technologies that I'm aware of, other than the Ivey-sol, that has the ability to successfully decontaminate NORMs contaminated waste to a safe handling and disposal level."

With the oil and gas industry its target client, Ivey adds: "We have a technology that works, and we want to bring it to the marketplace and see what we can do."

Ivey International Inc.

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