Question

EPA says emissions will not exceed applicable standards. The problem is there are NO standards for most of the chemicals that will be released. Will doxins be monitored, for example, and what will allowable emissions be?

Answer

As a CERCLA cleanup action, the Submerged Quench Incineration (SQI) will be required to achieve all Applicable or Relevant and Appropriate Requirements of State and Federal law. For SQI stack emissions, this includes the specific regulatory limits on SO_2, NOx, HCI, and CO.

For compounds which do not have specific standards, CERCLA also establishes a default protectiveness level of that which will not cause greater than a 1 in a million excess cancer in the nearest exposed population based on a 70-year lifetime exposure. In the May 1990 Final Decision Document for this project, the Army formally committed to use this approach. And thus, all emitted compounds will be under a general protectiveness standard.

The Army is legally bound by the Final Decision Document to maintain emissions of dioxins (and other compounds) below levels that would exceed the 1 in a million lifetime excess cancer risk or not operate the SQI.

Dioxins will be monitored during the Trial Burn. While the Army has no present plans for periodic monitoring of Dioxins after the Trial Burn, we will allow the State to conduct periodic spot check sampling for compounds of interest throughout operations. It is the Army's goal to operate the SQI and its' scrubbing equipment at the highest efficiency possible, i.e., lowest emissions.

Question

EPA claimed that destruction of Basin F wastes will achieve the legally required efficiency of 99.99%. EPA data shows no incinerator can meet this legal requirement when burning low waste concentrations. Since the most toxic components in Basin F---GB nerve agent and by-products of banned pesticides---are all present at or below these concentrations, will the trial burn use waste concentrations at real world levels, and if not, why?

Answer

Information from EPA varies by incinerator. The pilot testing at T-Thermal used carbon tetrachloride as the Primary Organic Hazard Constituent to determine Destruction Removal Efficiency (DRE). Although other detectable chemicals in the Basin F liquid were not used to determine DRE, no data from the pilot test suggested that 99.99 was not being achieved.

Basin F liquid does not contain GB nerve agent. Basin F liquid does contain Dimethylmethylphosphonate (DMMP) and Diisopropylmethylphosphonate (DIMP), which are by-products from the manufacture of GB nerve agent. Currently, DMMP is detected at 220-340 ppm and DIMP is below detection limits, but has been historically detected at approximately 40 ppm. Basin F liquid also contains the following pesticides:

Aldrin, Dieldrin, Endrin and Isodrin

Currently, Aldin is detected at approximately 1 ppm, while Dieldrin, Endrin and Isodrin are below detection limits. Historically, though, Dieldrin, Endrin and Isodrin have been detected in the range of .25 to .65 ppm.

For the Trial Burn, the EPA has directed the Army to use Chlorobenzene and Carbon tetrachloride as POHCs. These will be injected into the Basin F liquid waste feed at concentrations ranging from 500-5,000 ppm. Because it is the Army's goal to achieve the highest possible destruction and removal efficiency for all organic contaminants in the Basin F liquid, we are willing to explore the technical feasibility of near real time monitoring of the DRE for one or two other selected components (perhaps DMMP and Aldrin) during operations. Chlorobenzene and carbon tetrachloride will remain as the POHCs for Trial Burn.

Question

The Army recently used an SQI in an attempt to burn GB nerve agent in the South Pacific. Each day, and average of 22 major alarms (indicators of upsets) were sounded. Luckily, burning stopped after about one month, far from any major population center. Unfortunately, the same cannot be said with respect to the Arsenal SQI, which will burn wastes 40 times as long in a major metropolitan area. The army needs to present data on the Atoll SQI, and must show that none of the problems encountered there will be duplicated here.

Answer

The Army does not have an SQI at Johnston Atoll. The term, Submerged Quench Incinerator, specifically refers to a uniquely designed quench and downcomer that form the outlet of the incinerator combustion chamber. Specifically, this type of outlet forms a seal at the bottom of the incinerator chamber and prevents the exit of any exhaust gas

until it has bubbled through the quench liquid. Three advantages result from this type of cooling:

1. It results in a nearly instantaneous cooling of the exhaust gas from 1900°F to 190°F and minimize dioxin formation typically associated with certain intermediate temperature ranges.

2. No additional heat is required to keep the salts in molten form since the salts and exhaust gas enter the quench at the same time.

3. The exhaust gas is broken into thousands of tiny, hot bubbles moving through a cooling liquid media (versus thousands of water droplets falling through and cooling a hot gas) and any potential entrainment of cooling liquid as a particulate is minimized.

Data on the liquid incinerator at Johnston Atoll is not relevant to the SQI. The Army has and will continue to present information on the safety features and process monitoring and control system for the SQI at Rocky Mountain Arsenal.

Question

The Army claims it looked at 40 alternative technologies and found the SQI to be the least risky. In reality, the SQI was the least costly, not the least dangerous. If the Army was interested foremost in protecting public health, why NOT were ~~ALL~~ closed-loop technologies evaluated? Shouldn't the Navy's BCD technology now be evaluated, and if not, why?

Answer

We did look at over 40 technologies. SQI does represent the lowest risk. There is no such thing as a "totally closed-loop" technology. If ten million gallons go in, ten million come out. All treatment technologies will have by-products and emissions.

At the conceptual design stage, a cost <u>estimate</u> was developed that indicated that SQI <u>might</u> be the least costly. In <u>reality</u>, SQI has proven to be far more costly than any of the other alternative technologies. The majority of this cost increase can be directly related to changes made to enhance safety. [A few examples are: (1) enclosing the SQI in a building for weather protection {price $8-$10m; (2) Increasing the residence time--and hence size--of the SQI for greater DRE {price $2-$3m}; (3) Recovering the metals out of the scrubber brine rather than spray drying

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and landfilling {price $15-$20m}; (4) Conducting a critical design review in the middle of the design process with T-Thermal and Nittetu experts {price $1m}; (5) Designing an automatic nozzle purge and cleaning system even though it slightly reduces through put capacity {price $2-$4m in extended operations}; and (6) Incorporating a surrogate test program prior to testing Basin F liquid {price $2m}.]

Base-catalyzed decomposition (BCD) technology is not available or appropriate for treating Basin F liquids, and should not be evaluated. The BCD process is a free-radical dehalogenation (i.e., replaces chloride with hydrogen) process that has been demonstrated on only PCB-contaminated soil. Basin F liquid contains no PCBs. Nearly all the chloride contained in Basin F liquid is in the form of NaCl, i.e., table salt, and does not require dechlorination.

Question

The Atoll SQI contained an afterburner, as do most commercial incinerators. As an added safety feature, why wasn't this included at the Arsenal SQI?

Answer

The SQI is designed as a single-chamber incinerator with a 2-second residence time. This design is a scale up from the single-chamber pilot incinerator at T-Thermal that operated at a 1-1/2-second residence time. The T-Thermal pilot unit demonstrated a 99.9984% DRE on the POHC during pilot tests. An additional 1/2 second of residence time was added as a safety feature. An afterburner is not required. For your information, the total residence time in both chambers of the Johnston Atoll liquid incinerator is approximately 2 seconds.

Question

Venturi scrubbers are not highly regarded as being efficient for oganochloride and pesticide burners. Why was this technology chosen for this SQI, and what other abatement technologies were rejected?

Answer

Venturi scrubbers vary in efficiency based on throat configuration and operating pressure drop It is true that low-pressure drop Venturis' (10-30 in water column) are not regarded as being highly efficient particulate scrubbers. The SQI Venturi is a high-pressure drop Venturi (60-90 inches water column) of a proprietary T-Thermal design. It was chosen based on demonstrated performance that it will meet the State of Colorado particulate standard.