U.S. DEMIL, LLC

SAIC/LEIDOS Prime Contract No. W15QKN-09-9-1001
Subcontractor to SAIC under Purchase Order No. PO10119299
Challenges to the Demil Future

• Permitting - Title IV / MACT Standards for NEW sources
• Treaty Obligations – Landmines & ICMs
• R³ / Sale of Scrap Metals (Certified Safe)
• Funding – Cost of Demilitarization ($ per ton)
Science of Decineration™ Technology

• The disassociation of molecular bonds in hydrocarbons is a mature industrial technology.

• The industrial embodiment of the Decineration™ process is the use of an externally heated, rotating horizontal tube which essentially duplicates the laboratory model known as "a horizontal flat plate in atmosphere".
Material & Data Flow – Emissions System Comparison

Emissions Abatement System (EAS) Custom Designed for Decineration™ Technology

APE1236 Pollution Abatement System

Emissions Abatement System (EAS) Custom Designed for Decineration™ Technology
PROVEN DODICS

• Small Arms Ammunition

• PAD / CAD

• Bulk Explosive (RDX)

• N285 Mechanical Timed Fuze

• K184 Anti-Tank Landmine (cryo-fractured)
Processed 1390-N285 Mechanical Timed Fuze Post Processing

Processed 1390-N285 Mechanical Timed Fuze, cut to validate explosive free
1345-K184 Cryo-fractured Anti-Tank Mine After Processing
• All processed DODICs were examined by QASAS during formulation and proven demilitarized BY FIELD CHEMICAL TEST

• All DODICs were declared “SAFE” for scrap sale following processing to formula

• Potential to become “Certified Safe”
Sample N285
60% of American Metal Market (AMM) Magazine’s Consumer Buying Prices, No. 1 Heavy Melt, Chicago
Example:
If AMM No. 1 Heavy Melt = $375.00 per Gross Ton
Price: $0.1004 per lb.

Sample A652
36% of COMEX Copper
Example:
If COMEX Copper = $3.0640 per lb.
Price = $1.103 per lb.
### APE 1236 PAS vs. USD EAS

<table>
<thead>
<tr>
<th></th>
<th>APE 1236 PAS</th>
<th>Decination™ EAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Particulate Capture Efficiency</td>
<td>99.9%</td>
<td>99.9%</td>
</tr>
<tr>
<td>Hydrocarbon Destruction Efficiency (SVOC / TOC)</td>
<td>88%</td>
<td>99.9%</td>
</tr>
<tr>
<td>Metals Particulate Recovery</td>
<td>NO</td>
<td>YES</td>
</tr>
<tr>
<td>Fuel Oil Consumption</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>Meets MACT Standards for NEW sources</td>
<td>NO</td>
<td>YES</td>
</tr>
</tbody>
</table>

* MACT standards for NEW sources will affect ALL Carbon based systems
State Environmental Permitting Findings
Military Munitions Exemption Rule (MMER)

**MMER States**

**INDIANA**
1,000 pph SAA - CAD/PAD

Indiana’s Branch Chief - Air Permits, IDEM has indicated process would be considered a "REGISTERED SOURCE".

Relevant Office of Land Management personnel have stated the following "... we have read Mr. Matt Hale’s letter (USEPA) and it reinforces our initial evaluation of your process and the likelihood that a hazardous waste operating permit is not needed."

**Non-MMER States**

**UTAH**
1,000 pph SAA - CAD/PAD

State of Utah Department of Environmental Quality (UTDEQ) has reviewed the USD’s “Decineration” technology and has determined that while it is not an incineration or hazardous waste treatment process; they would require a Sub Part 'X' permit.

Their expressed expectation is that a standard application followed by a limited duration public hearing period would result in a permit being issued within ninety to one hundred eighty days (90-180) days from application. They foresee no complications that would stall or prohibit permitting of a “Decineration” processing plant.
CO₂
Emissions

- Supreme Court ruling, 29 April 2014, confirmed that EPA has the legal authority to regulate CO₂ as a pollutant.

- Negotiations in Paris for new international treaty limits on CO₂ emissions.

- CO₂ regulatory restrictions will be announced in the coming years, with likely enforcement by State regulators. The Decineration™ System will have a competitive advantage in a carbon constrained environment because of its electrical fuel source.

- This has far-reaching ramifications for any system using carbon-based fuels, which will affect the APE 1236 operation far more than the Decineration™ System; the APE 1236, is powered by oil (a carbon fuel) whereas the Decinerator™ is run on electricity, which can be provided by zero-carbon, renewable power (hydro, solar, or wind).
### Demilitarization as a Profit Center

#### 3 Technologies at TEAD

<table>
<thead>
<tr>
<th></th>
<th>Operation/Production Costs ($/Ton)</th>
<th>Waste Disposal Cost ($/Ton of Munitions)</th>
<th>Value of Recovered Materials ($/Ton of Munitions)</th>
<th>Total Cost of Operation using 21.8 Tons as Basis ($/Ton)*</th>
<th>Total Profit for 416 Tons **</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PAS</strong></td>
<td><strong>EAS</strong></td>
<td><strong>PAS</strong></td>
<td><strong>EAS</strong></td>
<td><strong>PAS</strong></td>
<td><strong>EAS</strong></td>
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<tr>
<td>Decinerator™</td>
<td>$1,083</td>
<td>$7</td>
<td>$1,027</td>
<td>$63</td>
<td>($820)</td>
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<tr>
<td>Ape 1236</td>
<td>$8,002</td>
<td>N/A</td>
<td>$162</td>
<td>$334</td>
<td>$7,830</td>
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<tr>
<td>Base Hydrolysis</td>
<td>$12,254</td>
<td>N/A</td>
<td>$8,626</td>
<td>$1</td>
<td>$20,879</td>
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</tbody>
</table>

**NOTES:**

PAS – Pollution Abatement System designed and used for treatment of APE 1236 emissions

EAS – Emissions Abatement System designed and used for Decineration™ technology exclusive of TEAD technology Comparison Study

* 21.8 tons of munitions were processed by Decineration™ technology for the comparison of this study. APE 1236 is based on one-time G21X tests. Base Hydrolysis costs represent historical data provided by TEAD.

** Profit Comparisons based upon a USD Decinerator™ with EAS and an APE1236 as currently configured 416 tons per year / 208 days of munitions processing (historical TEAD Production APE1236 rate)
Standard ISO Configuration
Field Deployable
Airlift Capable
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