SECTION 6 - TECHNOLOGY SAFETY DATA SHEET

TECHNOLOGY SAFETY DATA SHEET
AIMM TECHNOLOGIES, Inc.
HYDROKINETICS™ Cleaning Process

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SECTION 2: PROCESS DESCRIPTION

The Hydrokinetics™ cleaning process, for the clearing and cleaning of fouled interiors of tubes, pipes, and lines is based in the induction of "Sonic Resonance" into the cleaning water stream. This Sonic Resonance travels through the water stream and safely transfers to both the tube and the fouling material. Because of the different compositions of the tube and the fouling material, they resonate at different frequencies, breaking the bond between them and allowing the fouling to be expelled quite easily. Fouling material is generally seen extruding from the end of the tube in large snake-like pieces rather than particulated as in conventional hydro blasting. The equipment for the Hydrokinetics™ process is compact and portable, consisting of hydraulic monitoring devices in a sealed cabinet.

SECTION 3: TECHNOLOGY PHOTOS

Figure 1. Hydrokinetics™ ™ console.

Figure 2. Hydrokinetics™ console pneumatic valves & gages.

Figure 3. HPW plunger pump.

Figure 4. Pipe blocking fouling cleared.

SECTION 3: TECHNOLOGY PHOTOS (CONTINUED)

Figure 5. Pipe blockage/fouling cleared.

Figure 6. Cleaned fouling materials using Hydrokinetic™ cleaning process.

SECTION 4: CONTAMINANTS AND MEDIA

The AIMMTECH Hydrokinetics™ cleaning process does not produce any contaminants. However, because the blocked piping may contain contaminants inline filters should be installed to reduce the likely hood of system contamination. The entire system as observed could become contaminated. The possible contaminants will need to be identified as part of a site characterization prior to the beginning of the job. A monitoring plan will need to be considered on a site-by-site and job-by-job basis.

SECTION 5: ASSOCIATED SAFETY HAZARDS

Probability of Occurrence of Hazard:

1 Hazard may be present but not expected over background level
2 Some level of hazard above background level known to be present
3 High hazard potential
4 Potential for imminent danger to life and health

A. ELECTRICAL (LOCKOUT/TAGOUT)	RISK RATING: 4

The AIMMTECH Hydrokinetics™ cleaning process uses no electrical power and is intrinsically safe. However, as observed there were no lockout/tagout abilities. The installation of a keyed controlled panel, with a locking cover is needed.

B. FIRE AND EXPLOSION	RISK RATING: 1

There is minimal risk from fire and explosion depending upon the contents of the blocked pipeline. Vapors, gases, liquids, and solids could all be found within the blocked piping. It is paramount that the contents of the blocked pipeline be known before any work begins. AIMMTECH Hydrokinetics™ cleaning process as observed is intrinsically safe and could be used in a potentially explosive atmosphere.

C. CONFINED SPACE ENTRY	RISK RATING: 4

Working with AIMMTECH Hydrokinetics™ cleaning process in any work area that meets the definition of a confined space provides the potential for serious harm. All such projects must be planned carefully and compliance with OSHA standards is essential to protect workers.

D. MECHANICAL HAZARDS	RISK RATING: 2-3

Operating AIMMTECH Hydrokinetics™ cleaning process presents some mechanical hazards since there are some moving parts within the system. The HPW pump and air compressor are the sources of mechanical movement. All moving parts need to be guarded and lockout/tagout procedures apply.

SECTION 5: ASSOCIATED SAFETY HAZARDS (CONTINUED)	
E. PRESSURE HAZARDS	RISK RATING: 4
The air and water hoses present a potential struck by hazard if they were to rupture or disconnect. Frequent inspection is advised. Proper air and water hose selection for the positive pressures involved is required.	
F. TRIPPING AND FALLING	RISK RATING: 2
The air and water hoses should be located as not to impede personnel. All hoses need to be positioned to avoid creating tripping hazards.	
G. LADDERS AND PLATFORMS	RISK RATING: 1
AIMMTECH Hydrokinetics™ cleaning process did not require ladders or scaffolds as observed. It may still be necessary to work on ladders occasionally for connection to blocked piping.	
H. MOVING VEHICLES	RISK RATING: 1
The presence of multiple pieces of equipment (which may be needed to unload and load technology) in relationship to a small area of operation may pose a significant danger. Sufficient warning devices such as horns, bells, lights, and back up alarms should be used.	
I. BURIED UTILITIES, DRUMS, AND TANKS	RISK RATING: N/A
Not part of this technology.	
J. PROTRUDING OBJECTS	RISK RATING: 2
The hose connections to the console are obtrusive. Redesigning the location of the inlets and outlets is suggested. The hoses protruding from the valves create more of an obstacle for personnel to move around. Once the piping connections are redesigned, tripping hazards will be reduced.	
K. GAS CYLINDERS	RISK RATING: N/A
Not part of this technology.	
L. TRENCHING AND EXCAVATIONS	RISK RATING: N/A
Not part of this technology.	
M. OVERHEAD LIFTS	RISK RATING: N/A
Not part of this technology.	
N. OVERHEAD HAZARDS	RISK RATING: N/A
Not part of this technology.	

SECTION 6: ASSOCIATED HEALTH HAZARDS	
Probability of Occurrence of Hazard: 1 Hazard may be present but not expected over background level 2 Some level of hazard above background level known to be present 3 High hazard potential 4 Potential for imminent danger to life and health	
A. INHALATION HAZARD	RISK RATING: 1-4
Personnel exposure is greatly dependent upon the site of operation. Air monitoring may be warranted depending upon the contaminants present.	
B. SKIN ABSORPTION	RISK RATING: 1-4
Personnel exposure is greatly dependent upon the site of operation.	
C. HEAT STRESS	RISK RATING: 1
Technology does not produce a hazard but ambient conditions need to be considered.	
D. NOISE	RISK RATING: 1
Noise monitoring has shown values below and above the OSHA Permissible Exposure Limit for an 8-hour work shift. If design or system changes are made more monitoring is warranted. A hearing conservation program should be in place due to the over exposures projected. Personnel in the areas of the air compressor and the HPW pump should wear ear protection.	
E. NON-IONIZING RADIATION	RISK RATING: N/A
Not part of this technology.	
F. IONIZING RADIATION	RISK RATING: N/A
Not part of this technology.	
G. COLD STRESS	RISK RATING: 1
Technology does not produce a hazard but ambient conditions need to be considered.	
H. ERGONOMIC HAZARDS	RISK RATING: 2
The operation of AIMMTECH Hydrokinetics™ cleaning process greatly reduces the stresses and strains on the body that are a normal part of pipe unblocking. The connection to the blocked piping presents increased risk of back problems because of the poor postures involved. Proper lifting techniques need to be a part of personnel training. Two personnel should perform the movement of the console, until the console is redesigned.	
I. OTHER	RISK RATING: 1-4
Before work can begin, a site-specific evaluation must be completed due to environmental conditions. Contaminants within the blocked piping must also be known so that proper PPE can be used.	

SECTION 7: PHASE ANALYSIS

A. CONSTRUCTION/START-UP

Training on the AIMMTECH Hydrokinetics™ cleaning process should include: lockout/tagout, hazard communication, noise conservation, and hazard assessment. The set-up phase requires the unloading of the console, which needs to be performed by two personnel. Given that most of this will be done on unfamiliar sites, there are significant risks associated with moving vehicles. Setting up the system also involves establishing air and water connections. The hoses involved need to be inspected before installation. This phase presents several hazards including struck by/caught between hazards, pinch points, slips/trips/falls, and muscular/back injury.

B. OPERATION

The operational phase presents several hazards including:

- Lockout/tagout,
- Potential exposure to contaminants dependent upon location and blocked piping,
- Noise hazards dependent upon location, and
- Risks from excessive pressure.

C. MAINTENANCE

Routine maintenance may require respiratory protection, depending on the toxicity of the contaminant and the part of the system that is being worked on. Any maintenance work is particularly hazardous if contaminants are within the system. Lockout/tagout programs must be carefully followed to avoid a serious injury.

D. DECOMMISSIONING

The decommissioning phase presents several hazards including exposure to the contaminants, pinch points, slips/trips/falls, and muscular/back injury.

SECTION 8: HEALTH AND SAFETY PLAN REQUIRED ELEMENTS

(If this technology is used on hazardous waste sites, the following information should be included in the written Health and Safety Plan that is required by OSHA under 29 CFR1910.120.)

A. AIR MONITORING

Air monitoring of personnel exposures to toxic substances is warranted if contaminants are within the blocked piping system. The possibility of vapor, gas, liquid, and solid contaminants exists. Air monitoring is particularly critical when the blocked piping is contaminated with radioactive materials or highly toxic agents.

SECTION 8: HEALTH AND SAFETY PLAN REQUIRED ELEMENTS (CONTINUED)

(If this technology is used on hazardous waste sites, the following information should be included in the written Health and Safety Plan that is required by OSHA under 29 CFR1910.120.)

B. WORKER TRAINING

Worker training is an important element in preventing injuries. Training in the operation of AIMMTECH Hydrokinetics™ cleaning process is obviously important. Special emphasis should be placed on training workers to operate the controls of the console. Other safety and health training that may prove helpful for the workers include:

- RADWORKER I,
- RADWORKER II,
- HAZWOPER (Hazardous Waste Operations and Emergency Response),
- HAZCOM (Hazard Communication),
- Respiratory Protection,
- Hearing Conservation,
- Ergonomics (proper lifting, bending, stooping, kneeling, etc.),
- Heat Stress (learning to recognize signs and symptoms),
- Cold Stress (learning to recognize signs and symptoms),
- Personal Protective Equipment,
- Electrical Safety,
- Lockout/Tagout,
- Hand Signal Communication, and
- Construction Safety (OSHA 500).

C. EMERGENCY RESPONSE

Emergency response planning for a site needs to assure adequate coverage for hazards described in the TSDS. Having at least one worker per shift trained in CPR and first aid is recommended. The crew should discuss the worst-case scenarios at each site and plans should be made on how to deal with each scenario before work begins. If contaminants are within the piping actions need to be taken to protect all personnel.

D. MEDICAL SURVEILLANCE

A good general screening of the crew's health with emphasis on the back and cardiovascular/respiratory system is usually warranted. Depending on the contaminant present and the airborne levels, medical surveillance may be required by OSHA standards. A hearing conservation program needs to be effect. In addition, annual audiograms may be warranted depending upon typical daily working conditions.

E. INFORMATIONAL PROGRAM

Workers must be trained in specific operation of equipment before use.

SECTION 9: COMMENTS AND SPECIAL CONSIDERATIONS
The AIMMTECH Hydrokinetics™ cleaning process technology is more protective of workers than standard pipe unblocking. Only personnel who have been adequately trained should attempt to operate the technology. Knowledge of the blocked piping is paramount to the safety and health of all personnel.