

Enhanced Brine Dewatering System (EBDS)

PI: Ross Remiker / Orbital Technologies Corporation – Madison WI

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Identification and Significance of Innovation

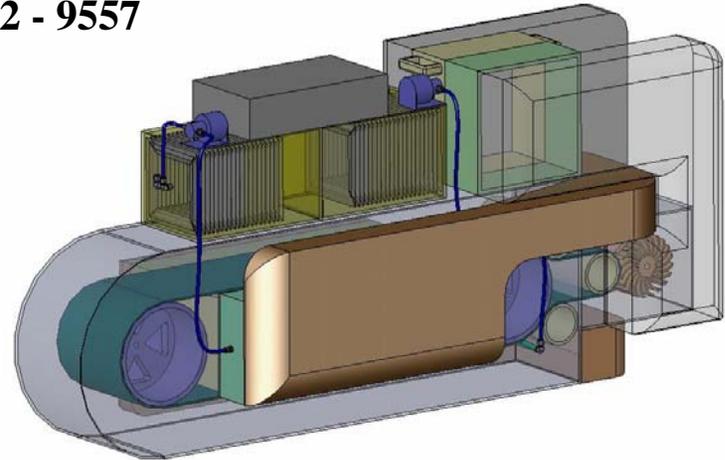
EBDS provides nearly complete recovery of water from waste water brines without the use of consumable wicks

Efficiency is increased by using heat generated by the condenser to evaporate water from the brine

Microbial growth is minimized by eliminating porous materials

Large quantity of brine salt can accumulate between container changeouts, minimizing crew time

Volumetrically efficient dried salt containment method minimizes mass and volume of expendable hardware.



Technical Objectives and Work Plan

Develop methods of removing, collecting, and containing dried brine salts after deposition onto substrate and water evaporation is complete

Compare vapor-compression refrigeration cycle and thermoelectric devices and determine which is most appropriate condenser cooling method for EBDS

Develop an ersatz formulation to accurately and economically simulate Lunar outpost reverse osmosis brine

Evaluate transient evaporation rates of brines on a heated substrate

Design and build a fully functional Lunar outpost EBDS prototype

Optimize the performance and run long-term tests on the EBDS prototype

Perform chemical and microbial analysis of the prototype EBDS air streams, condensate, and hardware.

Perform an ESM analysis of EBDS prototype.

Investigate methods of removing undesirable chemical compounds from the EBDS air stream and condensate.

NASA and Non-NASA Applications

EBDS can recover water from reverse osmosis brines and other waste water streams on NASA and commercial Lunar and Martian outposts, reducing the launch mass and volume associated with supplying fresh water.

With minor modifications from the current concept, the EBDS can recover water from reverse osmosis brines and other waste water streams in NASA and commercial aerospace microgravity applications, including orbiting outposts and long-duration transit missions.

Firm Contacts

Ross Remiker
Orbital Technologies Corporation
1212 Fourier Dr.
Madison, WI 53717
(608) 229-2746
remikerr@orbitec.com