

International Space Station Potable Water Characterization for 2013

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ABSTRACT

In this post-construction, operational phase of International Space Station (ISS) with an ever-increasing emphasis on its use as a test-bed for future exploration missions, the ISS crews continue to rely on water reclamation systems for the majority of their water needs. The onboard water supplies include US Segment potable water from humidity condensate and urine, Russian Segment potable water from condensate, and ground-supplied potable water, as reserve. In 2013, the cargo returned on the Soyuz 32-35 flights included archival potable water samples collected from Expeditions 34-37. The Water and Food Analytical Laboratory at the NASA Johnson Space Center continued its long-standing role of performing chemical analyses on ISS return water samples to verify compliance with potable water quality specifications. This paper presents and discusses the analytical results for potable water samples returned from Expeditions 34-37, including a comparison to ISS quality standards. During the summer of 2013, the U.S. Segment potable water experienced an anticipated temporary rise and fall in total organic carbon (TOC) content, as the result of organic contamination breaking through the water system's treatment process. Analytical results for the Expedition 36 archival samples returned on Soyuz 34 confirmed that dimethylsilanediol was once again the responsible contaminant, just as it was for comparable TOC rises in 2010 and 2012. Discussion herein includes the use of the in-flight Total Organic Carbon Analyzer (TOCA) as a key monitoring tool for tracking these TOC rises and scheduling appropriate remediation action.

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