# Analysis of Mir Archival Water Samples

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## INTRODUCTION

A portion of the potable water supplied to the Russian cosmonauts, American astronauts, and other occupants of the Russian Mir Space Station is produced by the direct recycle of water from humidity condensate. Additional supplies come from ground supplied potable water that is delivered on a Progress resupply spacecraft, or processed fuel cell water transferred from the Shuttle. This project is being conducted to determine the potability of the water supplied on Mir, to assess the reliability of the water reclamation and distribution systems and to aid in developing water quality monitoring standards and procedures for International Space Station.

### Hypothesis

Detailed analysis of reclaimed and other Mir supplied potable waters will confirm that the design of the Mir purification and distribution systems is adequate to maintain water of potable quality.

### Objectives

1. Characterize the chemical composition of Mir humidity condensate to support development and testing of the water recycling and monitoring systems for the International Space Station (ISS)

2. Characterize the chemical composition of the ground-resupply water prior to launch and on orbit

3. Characterize the chemical composition of Mir recycled water to evaluate the efficiency of on-board water processors and aid in the development of ISS water processing and monitoring technology

4. Determine and compare the chemical composition of Mir and Shuttle humidity condensate

5. Provide inflight testing of water collection hardware being developed to collect water samples on ISS

### Background/History

Historically, water provided for crew consumption during U.S. space missions has either been launched from the ground or produced as a byproduct of fuel cell operation. Reclamation and purification of spacecraft wastewaters as practiced on the Russian Space Station Mir, will be required for supplying crewmembers of the International Space Station with potable and hygiene water.

This experiment has flown under the Human Life Sciences Discipline during the Mir 18/NASA 1, the Mir 19, the Mir 20/STS-74, the Mir 21/NASA 2/STS-79, and the Mir22/NASA 3/STS-81 missions. In addition, this activity was performed under the Space Medicine Program during the Mir 23/NASA 4/STS-84 and the Mir 24/NASA5/STS-86 missions.

## METHODS/RESEARCH OPERATIONS

### Method/Protocol

The water experiment kit (WEK) contained the disinfectant wipes, potable water samplers, waste bags, chemical sample, postflight analysis bags, and storage bags needed for water sampling (see Figure 1). During inflight water sampling sessions (see Table 1), the WEK was unstowed. A prepackaged disinfectant wipe containing 1 ml of benzalkonium chloride in 250 ml of water was retrieved from the kit and used to disinfect the Mir galley-hot, galley-cold, or SVO-ZV water port. Next, a potable water sampler was connected to the port. A waste bag was then connected to the potable water sampler. Using the waste bag, 50 ml of water were collected and discarded. Next, the chemical sample bag was connected to the sampler and 700 ml of water were collected. The sample bag was placed in a self sealing storage bag and stowed for return on the Shuttle. These procedures were used to collect galley-hot, galley-cold, and SVO-ZV (ground-supplied) water for postflight chemical analysis for this investigation. Following the collection of the chemical samples, microbiological samples were obtained for a separate experiment. The procedures used for microbiological sample collection, analysis, and preliminary results are reported elsewhere in "Microbiological Investigations of the Mir Station and Flight Crew" [4].

Postflight chemical analysis of samples occurred at Johnson Space Center (JSC) and the Institute for

Biomedical Problems (IBMP). Following recovery of the samples on the ground, the samples were allocated (See Table 2) for distribution to the water analysis laboratories at JSC and IBMP. Parameters tested at JSC included total carbon components (total inorganic carbon, purgeable organic carbon, nonpurgeable organic carbon and total organic carbon), specific organics (alcohols, organic acids, semivolatiles, volatiles, nonvolatiles, formaldehyde), and metals. Parameters tested by IBMP included conductivity, pH, color, chemical oxygen demand, total solids, calcium, magnesium, total hardness, and silver.

### Functional Objectives

**FO1.** Preflight collection of ground-supplied water at RSC Energia, Korolov, Russia

**FO2.** Water Sampling Hardware Setup

**FO3.** Inflight collection of hot, cold, and SVO-ZV (stored) water

**FO4.** Inflight collection of humidity condensate

**FO5.** Inflight collection of partially processed humidity condensate

**FO6.** Postflight analysis of samples

### Hardware Items

Major hardware items used in flight for this experiment:

**HW1.** Water Experiment Kit - NASA provided

**HW2.** Disinfectant/Antiseptic Wipes - NASA provided

**HW3.** Potable Water Samplers (with Mir port adapter interfaces) - NASA provided

**HW4.** Waste bags and Chemical Sample, Postflight Analysis Bags - NASA provided

**HW5.** Self Sealing Storage Bags - NASA provided

**HW6.** Atmospheric Condensate Sampler - RSA provided

Major hardware items used postflight for this experiment:

**HW7.** HP 5890 Gas Chromatograph (GC) with HP5971A Mass Spectrometer (MS)- NASA provided

**HW8.** Waters Quanta 4000 Capillary Electrophoresis System - NASA provided

**HW9.** OI 700 Carbon Analyzer - NASA provided

**HW10.** Sievers Model 800 Total Organic Carbon Analyzer - NASA and RSA provided

**HW11.** HP 7694 Headspace sampler with a HP 5890 GC and 5972 Mass Selective Detector - NASA provided

**HW12.** HP 5989 Mass Spectrometer (MS) with a 1090 Liquid Chromatograph with Particle beam & Thermospray interfaces - NASA provided

**HW13.** pH meter - RSA and NASA provided

**HW14.** Conductivity meter - RSA provided

## RESULTS

### List of Pre-, In-, and Postflight Anomalies

*Preflight Anomalies*

None

*Inflight Anomalies*

Sampling of galley hot water and SVO-ZV water was planned for the docked phase, but no samples were received. One condensate sample from Condensate Recovery System (CRS or SRV-K) (dated 1/17/98 2200 to 1/18/98 2200) contained only 0.25 ml of sample and the other condensate collected in a Teflon sample bag dated 1/26/98 1700 to 1/28/98 1500 was received empty. It appears that the SRV-K system did not receive sufficient condensate during the docked phase because the Shuttle humidity control system was dominant.

*Postflight Anomalies*

Two galley hot water samples collected in US supplied Teflon sample bags leaked during transport from KSC to JSC after landing. The leakage, however, did not adversely impact sample analysis.

### Completeness/Quality of Data

All sample analyses have been completed.

## DISCUSSION

### Status of Data Analysis

All chemical analyses of the water samples have been completed.

### Preliminary Research Findings

*Regenerated Water*

Three recycled water samples were collected during Mir 24. Analytical results for these samples are reported in Table 4.

Physical Parameters - Conductivity in the Mir 24 regenerated water samples ranged from 48 to 200 $\mu$S/cm, compared with 5.8–1130 $\mu$S/cm in samples collected from Mir 18 through Mir 23 [2,3]. Turbidity in all of the Mir 24 samples exceeded the U.S. maximum contaminant limit of 1 NTU specified in the Joint U.S./Russian Potable Water Specifications for International Space Station (Table 3). Turbidity in these samples ranged from 2.88 to 4.29 NTU; turbidity in samples collected from Mir 18 to Mir 23 ranged from 0.6 to 7.0 NTU [2,3]. The pH range was consistent in samples collected during Mir 18 through Mir 24, and ranged from 2.56 to 10.0 for all samples analyzed [2,3].

The Mir 24 recycled water samples analyzed measured 10 and 15 degrees of color, respectively (one sample was not analyzed because of limited sample volume). For odor, ratings of 0 (on a 5-point scale) were assigned to the Mir 24 samples indicating that no odor was detected in these samples.

Chemical oxygen demand (COD) values for the Mir 24 samples ranged from 12 to 17 mg/L, compared with 3-105 mg/L for all samples collected from Mir 18 through Mir 23 samples. The Mir 24 values were within the 100 mg/L limit outlined in the Russian potable water specifications for the International Space Station (Table 3).

Inorganic Parameters - Ionic species identified in the Mir 24 samples include chloride (<0.15 to 11.6 mg/L), fluoride (<0.10 to 0.12 mg/L), nitrate (<0.11 to 0.18 mg/L), sulfate (<0.75 to 13.3 mg/L), calcium (6.83–26.4 mg/L), magnesium (0.79– 5.97 mg/L), potassium (<0.002– 1.55 mg/L), and sodium (0.06–3.79 mg/L). Metals detected in the Mir 24 recycled water samples include silver, aluminum, barium, copper, iron, manganese, nickel, lead, and zinc.

Organic Parameters - Nearly 250 organic compounds were tested for in the Mir 24 samples. These compounds were classified as volatile organic compounds, semivolatile organic compounds, carboxylates, alcohols, aldehydes, and urea. Total organic carbon (TOC) was also performed. Volatile organic compounds detected in the Mir 24 samples include acetone (none detected to 52 µg/L) and chloroform (none detected to 37 µg/L). Chloroform has been detected previously in Mir 18-Mir 23 samples at levels ranging from none detected to 244 µg/L. Acetone has also previously been detected at levels of up to 131 µg/L.

Benzyl alcohol, 2-ethyl-1-hexanol, formate, formaldehyde, and ethanol were the remaining organic compounds detected in the Mir 24 samples. These compounds were found in fairly low levels, except for ethanol and formate. Ethanol was detected in one of three samples at 1129 µg/L. Formate was found in two of the three samples analyzed, at values of 26.8 and 5.3 mg/L, respectively. Previous Mir samples (Mir 18 to Mir 23) contained up to 2447µg/L of ethanol and up to 29.1 mg/L of formate.

The mean concentration of TOC in the Mir 24 samples was 6.7 mg/L (range: 3.1–11.1 mg/L) according to results measured by the U.S. In contrast, for the same samples, results from the Russian side averaged 16.9 mg/L. In both data sets, the Mir 24 reclaimed water samples did not meet the U.S. potable water specification for the International Space Station (0.5 mg/L), although they did meet the Russian specification of 25 mg/L [3].

Accountability of organic carbon was calculated by summing the concentration of organic carbon for each organic compound analyzed and comparing this result to the total organic carbon value. This comparison gives an indication of the theoretical yield of all organic compounds in the sample. With regard to recovery of organic carbon from the Mir 24 samples, an average of 38.4% of the organic content could be identified using present analytical techniques. This percentage is considerably higher than that obtained for the Mir 18-Mir 23 samples, which averaged 12%.

*Stored Water*

One SVO-ZV sample was collected during this mission. Results of this sample are reported in Table 5. The physical parameters measured for this sample were consistent with values measured in previous Mir samples. The pH for this sample was 7.16, the conductivity measured 195 µS/cm, the turbidity measured 1.66 NTU, and the chemical oxygen demand (COD) value was 25 mg $O_2$/L. Ten degrees of color was found in the sample, while no odor (rating = 0) was detected. As with most other stored water samples, the turbidity level in this sample exceeded the NASA water quality standard of 1 NTU.

Inorganic compounds detected in this sample were similar to those found in samples collected during Mir 18 - Mir 23. Fluoride, calcium, magnesium, sodium, silver, aluminum, barium, cadmium, iron, nickel, and zinc were found in this sample. Only cadmium was found to exceed the NASA/RSA specification (see Table 3).

Semivolatile and volatile organic compounds identified in this sample include acetone (230 µg/L), benzaldehyde (4.9 µg/L), benzyl alcohol (43.5 µg/L), caprolactam (117.5 µg/L), diethyl phthalate (6.6 µg/L), 2-ethyl-1-hexanol (20.2 µg/L), and phenol (12.8 µg/L). Ethanol, at 6662 µg/L, was also detected in this sample, as well as acetate (0.19 mg/L) and formate (61.7 mg/L).

The total organic carbon (TOC) concentration of this sample was 7.67 mg/L. Stored water samples collected during Mir 18-Mir 23 had TOC values which ranged from 6.99 µg/L to 54.8 µg/L. Accountability of organic carbon was calculated by summing the concentration of organic carbon for each organic compound analyzed and comparing

this result to the total organic carbon value. For this stored water sample, approximately 100% of the organic content of the sample could be accounted.

*Condensate*

Three humidity condensate samples were collected using Russian supplied hardware. These samples were taken at the inlet of the Condensate Recovery System (CRS). In addition during Mir 24, two other condensate samples were collected after initial processing using U.S. supplied hardware. These samples are denoted as Filter Reactor Condensate. A surface condensate sample was also taken. Analytical results for all of the condensate samples are reported in Table 6.

Physical Parameters - Conductivity levels for Mir 24 humidity condensate samples were similar to levels observed during Mir 19 through Mir 23 and ranged from 280-370 $\mu$S/cm. Levels observed during Mir 19 through Mir 23 ranged from 118-506 µS/cm. These levels are similar to the levels found in condensate samples collected on Space Shuttle missions STS-45, STS-47, STS-68, STS-89, and STS-91 [1,10]. Turbidity was not measured in the Mir 24 samples. The pH levels were 6.19, 7.66, and 7.67 in the condensate samples analyzed. Shuttle pH levels were similar, ranging from 6.41–7.08 [1,3,10].

Inorganic Parameters - Inorganic constituents measured in the Mir 24 humidity condensate samples included anionic species, cationic species, and metals. Ionic species identified in the humidity condensate samples include chloride, ammonia, lithium, potassium, sodium, magnesium, and calcium. Aluminum, barium, cadmium, chromium, copper, iron, manganese, molybdenum, nickel, lead, and zinc were also present in the Mir humidity condensate.

Organic Parameters - Several classes of organic compounds were detected in the condensate samples collected. Volatile organic compounds detected include acetone (from none detected to 199.6 $\mu$g/L), 2-butanone (from none detected to 26.4 µg/L), carbon disulfide (544-2751 $\mu$g/L), and methylene chloride (from none detected to 3.7 µg/L). All of these compounds also have been found in previous Mir and Shuttle samples [1,3,10].

Approximately thirty different semivolatile organic compounds were present in the Mir humidity condensate samples. Semivolatile organic compounds found in the greatest concentrations were 3-t-butylphenol (246.1–340.5 µg/L), caprolactam (942.4–2921.5 $\mu$g/L), N,N, dimethylacetamide (from none detected to 4203 $\mu$g/L), N,N, dimethylformamide (from none detected to 4225 µg/L), 2-ethoxyethanol (from none detected to 2428 $\mu$g/L), bis-2-ethylhexl adipate (from none detected to 18674 µg/L), 4-hydroxy-4-methyl-2-pentanone (from none detected to 875.8 µg/L), and tetramethylthiourea (472.9–925.9 µg/L).

Significant amounts of 1,2-ethanediol (ethylene glycol) were detected in the Mir 24 condensate samples indicating the presence of thermal coolant in the raw condensate during those times. Ethylene glycol was detected in condensate samples collected on 1/19/98 and 1/28/98 and were 342.5 mg/L and 270 mg/L respectively. Propylene glycol (1,2-propanediol) levels were 18.2 mg/L and 14 mg/L in these samples.

Methanol and formaldehyde were also detected in the Mir 24 samples. Formaldehyde levels ranged from 24.8 to 48.1 $\mu$g/L, while methanol was found in only one sample at 1500 µg/L. Samples collected during Mir 19 through Mir 23 had similar formaldehyde levels, with concentrations ranging from 2.2–82 $\mu$g/L [3]. Significantly higher levels of formaldehyde have been detected in Shuttle condensate samples [2,9]. No carboxylates, amines or urea were detected in any of the samples analyzed. On average, 56% of the organic constituents in the Mir 24 humidity condensate samples could be accounted.

In terms of the filter reactor condensate samples, two were received during this mission. However, one sample contained almost no volume (0.25 ml), so only ethylene glycol and propylene glycol analyses were performed for this sample. The analysis of the other sample showed decreased levels of most contaminants, indicating the filter reactor's effectiveness in removing contaminants in the initial processing of the condensate into potable water.

*Surface Condensate*

One surface condensate sample was collected during this mission, as a result of heavy condensation of liquid on the surfaces and walls of the Mir Space Station. The analysis of this sample showed increased levels of aluminum, cadmium, iron, nickel, and hydrocinnamic acid as compared to the atmospheric moisture (humidity condensate) collected at the inlet of the condensate recovery system. All other parameters were similar to those measured in the humidity condensate.

## Conclusions

The quality of the regenerated and stored waters, met performance requirements as determined through postflight chemical analysis. The analysis of samples has provided important data for assessing the potential risks of consuming recycled water, especially during the off-nominal conditions experienced with the Mir thermal-cooling system. Other conclusions based on the analytical data are as follows:

1. Turbidity levels in the regenerated water exceeded the U.S. specification for the International Space Station of 1 NTU.

2. Total organic carbon levels in the regenerated water and the stored water do not meet the U.S. specification of 0.5 mg/L, although they do meet the Russian standard of no more than 25 mg/L.

3. One sample analyzed from the Mir 24 mission did not meet the U.S./Russian Joint Specifications for International Space Station for nickel. Nickel was detected at 157 μg/L, whereas the specification is 100 μg/L.

4. No compounds have been detected at medically significant levels in the regenerated water samples collected during this mission.

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## TABLE 1. DATA COLLECTION SESSIONS/FUNCTIONAL OBJECTIVES

| Session Name | FO# | HW# | Scheduled Day | Actual Day | Samples/ Parameters |
|---|---|---|---|---|---|
| **Mir24** | | | | | |
| galley-hot water collection | 2,3,6 | 2-5<br>7-14 | MD104 | MD104<br>18 Nov 01 | 209 ml of water<br>Split: 139 ml US, 70 ml RSA |
| humidity condensate collection | 4,6 | 6-14 | MD104 | MD104<br>18 Nov 01 | 67 ml of water<br>Split: 48 ml US, 19 ml RSA |
| galley-hot water collection | 2,3,6 | 2-5<br>7-14 | MD114 | MD114<br>28 Nov 01 | 835 ml of water<br>Split: 585 ml US, 250 ml RSA |
| SVO-ZV (ground supplied) water collection | 2,3,6 | 2-5<br>7-14 | MD114 | MD114<br>28 Nov 01 | 767 ml of water<br>Split: 537 US, 230 ml RSA |
| humidity condensate collection | 4,6 | 6-14 | MD114 | MD115<br>29 Nov 01 | 702 ml of water<br>Split: 502 ml US, 200 ml RSA |
| filter reactor condensate collection | 5,6 | 6-14 | unscheduled | MD165<br>18 Jan 02 | 0.25 ml of water<br>Split: 0.25 ml US, 0 ml RSA |
| galley-hot water collection | 2,3,6 | 2-5<br>7-14 | MD162 | MD167<br>20 Jan 02 | 108 ml of water<br>Split: 79 ml US, 29 ml RSA |
| humidity condensate collection | 4,6 | 6-14 | MD162 | MD167<br>20 Jan 02 | 71 ml of water<br>Split: 49 ml US, 22 ml RSA |
| surface condensate collection | 6 | 2-5<br>7-14 | unscheduled | MD167<br>20 Jan 02 | 81 ml of water<br>Split: 81 ml US, 0 ml RSA |
| filter reactor condensate collection | 5,6 | 6-14 | unscheduled | MD176<br>29 Jan 02 | 29 ml of water<br>Split: 29 ml US, 0 ml RSA |

## TABLE 2. ALLOCATION OF MIR 24/NASA 6/STS-89 SAMPLES

| WAFAL ID | **98-0202-01** | **98-0202-03** | **98-0202-04** | **98-0202-06** | **98-0202-07#** |
|---|---|---|---|---|---|
| Mission | Mir 24 | Mir 24 | Mir 24 | Mir 24 | Mir 24 |
| Sample Description | Regenerated Water | Regenerated Water | Regenerated Water | Stored Water | Condensate |
| Sample Location | Galley-Hot | Galley-Hot | Galley-Hot | SVO-ZV | CRS |
| Sample Date | 11/17/97 | 11/27/97 0:00 | 1/19/98 0:00 | 11/27/97 | 11/17/97 |
| Analysis/Aliquot | ml | ml | ml | ml | ml |
| pH, conductivity, turbidity | BNA split | BNA split | BNA split | BNA split | BNA split |
| Alcohols | 5 | 5 | 2 | 5 | 1 |
| Formaldehyde | 5 | 10 | 5 | 5 | 5 |
| Glycols/Nonvolatiles | 5 | 5 | 5 | 5 | 2 |
| Anions, Cations | 4 | 4 | 4 | 4 | 2 |
| Acids, Amines | 4 | 4 | 2 | 4 | 3 |
| Semivolatiles (BNA) | 50 | 250 | 25 | 250 | 14 |
| Metals | 25 | 50 | 5 | 50 | 5 |
| Total Organic Carbon (TOC) | 25 | 125 | 25 | 125 | 10 |
| Volatiles | 16 | 16 | 6 | 16 | 6 |
| Archive | - | 116 | - | 73 | - |
| NASA Total | 139 | 585 | 79 | 537 | 48 |
| Russian Space Agency Total | 70 | 250 | 29 | 230 | 19 |
| Total (mL) | 209 | 835 | 108 | 767 | 67 |

## TABLE 2. ALLOCATION OF MIR 24/NASA 6/STS-89 SAMPLES

| WAFAL ID | **98-0202-08** | **98-0202-09** | **98-0202-10** | **98-0202-11#** | **98-0202-16** |
|---|---|---|---|---|---|
| Mission | Mir 24 | Mir 24 | Mir 24 | Mir 24 | Mir 24 |
| Sample Description | Condensate | Condensate | Filter reactor Condensate** | Surface Condensate | Filter reactor Condensate** |
| Sample Location | CRS | CRS | CRS | unknown | CRS |
| Sample Date | 1/19/98 | 1/28/98 | 11/28 - 11/29/97 | 1/19/98 | 1/17 - 1/18/98 |
| Analysis/Aliquot | ml | ml | ml | ml | ml |
| pH, conductivity, turbidity | BNA split | BNA split | BNA split | BNA split | - |
| Alcohols | 1 | 1 | 5 | 2 | - |
| Formaldehyde | 5 | 2 | 5 | 5 | - |
| Glycols/Nonvolatiles | 2 | 2 | 5 | 5 | 0.25## |
| Anions, Cations | 2 | 2 | 4 | 2 | - |
| Acids, Amines | 3 | 3 | 4 | 3 | - |
| Semivolatiles (BNA) | 15 | 5 | 250 | 20 | - |
| Metals | 5 | 4 | 50 | 9 | - |
| Total Organic Carbon (TOC) | 10 | 4 | 125 | 10 | - |
| Volatiles | 6 | 6 | 16 | 6 | - |
| Archive | - | - | 38 | 19 | - |
| NASA Total | 49 | 29 | 502 | 81 | 0.25## |
| Russian Space Agency Total | 22 | 0 | 200 | 0 | - |
| Total (mL) | 71 | 29 | 702 | 81 | 0.25## |

CRS = condensate recovery system
**partially processed humidity condensate
# contains solids, centrifugation required
## Essentially empty, recovered 0.25 mL

## TABLE 3. JOINT U.S./RUSSIAN POTABLE WATER SPECIFICATIONS FOR INTERNATIONAL SPACE STATION

| Water Parameter | U.S. Maximum Contaminant Level (MCL) | Russian Maximum Contaminant Level (MCL) |
|---|---|---|
| pH[1] | 5.5-9.0 pH units | 5.5-9.0 pH units |
| Color[2] | 15 Pt-Co units | 20 degrees |
| Taste[2] | 3 TTN | 2 points |
| Odor[2] | 3 TON | 2 points |
| Total Dissolved Solids[3] | 100-1,000 mg/L | 100-1,000 mg/L |
| Turbidity[2] | 1 NTU | 1.5 mg/L |
| Total Gas | 5% volume @1 ATM, 20°C | 5% volume @1 ATM, 20°C |
| Ammonia ($NH_3^-N$) | 2 mg/L | 2 mg/L |
| Arsenic | 0.01 mg/L | 0.01 mg/L |
| Barium | 1 mg/L | 1 mg/L |
| Cadium | 0.005 mg/L | 0.005 mg/L |
| Calcium | 100 mg/L | 100 mg/L |
| Chlorine-total (includes $Cl^-$) | 250 mg/L | 250 mg/L |
| Chromium | 0.1 mg/L | 0.1 mg/L |
| Copper | 1 mg/L | 1 mg/L |
| Fluorine | 1.5 mg/L | 1.5 mg/L |
| Iodine-total (includes $I^-$) | 15 mg/L | 15 mg/L |
| Iodine-residual[4] | 1.0-4.0 mg/L | 1.0-4.0 mg/L |
| Iron | 0.3 mg/L | 0.3 mg/L |
| Lead | 0.05 mg/L | 0.05 mg/L |
| Magnesium | 50 mg/L | 50 mg/L |
| Manganese | 0.05 mg/L | 0.05 mg/L |
| Mercury | 0.002 mg/L | 0.002 mg/L |
| Nickel | 0.1 mg/L | 0.1 mg/L |
| Nitrate ($NO_3^-N$) | 10 mg/L | 10 mg/L |
| Selenium | 0.01 mg/L | 0.01 mg/L |
| Silver | 0.5 mg/L | 0.5 mg/L |
| Sulfate | 250 mg/L | 250 mg/L |
| Zinc | 5 mg/L | 5 mg/L |
| Total Hardness (Ca & Mg) | 7 meq/L | 7 meq/L |
| Total Bacteria[2] | 100 CFU/100 ml | 10,000 CFU/100 ml |
| Coliform Bacteria | <1 CFU/100 ml | <1 CFU/100 ml |
| Virus | <1 PFU/100 ml | <1 PFU/100 ml |
| Cyanide | 200 μg/L | 200 μg/L |
| Total Phenols | 1 μg/L | 1 μg/L |
| Total Organic Carbon (TOC) | 500 μg/L | 25,000 μg/L |
| Uncharacterized TOC | 100 μg/L | no limit |
| Oxygen Consumption-COD | no limit | 100 mg/L |

[1]pH range applies only before iodination

[2]Parameters have different values for U.S. and Russian supplied water because of different analytical methods used

[3]The 100 mg/L limit applies to the water before mineralization. After mineralization, this parameter will not exceed 1,000 mg/L

[4]Range of required level if iodine is used as a biocide

## TABLE 4. REGENERATED WATER RESULTS

| Mission<br>Sample Location<br>Sample Description<br><br>Sample Date<br>Analysis/Sample ID | Units | Test Conducted by | Maximum Contaminant Level (MCL) | Maximum Contaminant Level Source | Mir 24<br>galley-hot<br>regenerated<br>water<br>11/17/97<br>98-0202-01 | Mir 24<br>galley-hot<br>regenerated<br>water<br>11/27/97<br>98-0202-03 | Mir 24<br>galley-hot<br>regenerated<br>water<br>1/19/98<br>98-0202-04 |
|---|---|---|---|---|---|---|---|
| **Conductivity** | µS/cm | U.S. | | | 102 | 48.0 | 200 |
| **Conductivity** | µS/cm | Russia | | | 183 | 52 | NA |
| **pH** | pH units | U.S. | 5.5-9.0 | NASA/RSA | 6.72 | 6.81 | 7.53 |
| **pH** | pH units | Russia | 5.5-9.0 | NASA/RSA | 7.2 | 7.3 | NA |
| **Turbidity** | NTU | U.S. | 1 | NASA/RSA | 4.29 | 2.88 | 4.21 |
| **Turbidity** | mg/L | Russia | 1.5 | NASA/RSA | NA | NA | NA |
| **Color True** | degrees | Russia | 15 Pt-Co units/20 | NASA/RSA | 15 | 10 | NA |
| **Odor at 20°C** | grade | Russia | 3 TON/2 | NASA/RSA | 0 | 0 | 0 |
| **Taste at 20°C** | grade | Russia | 3 TTN/2 | NASA/RSA | NA | NA | NA |
| **Total Solids** | mg/L | Russia | 1.5 | NASA/RSA | NA | NA | NA |
| **Total Hardness** | meq/L | Russia | 7 | NASA/RSA | NA | 0.6 | NA |
| **Chemical Oxygen Demand** | mg $O_2$/L | Russia | no limit/100 | NASA/RSA | 17 | 12 | 17 |
| **Anions (CE/IC)** | | | | | | | |
| Bromide | mg/L | U.S. | | | <0.50 | <0.50 | <0.50 |
| Chloride | mg/L | U.S. | 200 | NASA/RSA | <0.15 | <0.15 | 11.60 |
| Fluoride | mg/L | U.S. | 1.5 | NASA/RSA | <0.10 | <0.10 | 0.12 |
| Nitrate as Nitrogen (NO3-N) | mg/L | U.S. | 10 | NASA/RSA | <0.11 | <0.11 | 0.18 |
| Nitrite as Nitrogen (NO2-N) | mg/L | U.S. | | | <0.08 | <0.08 | <0.08 |
| Phosphate | mg/L | U.S. | | | <0.24 | <0.24 | <0.24 |
| Sulfate | mg/L | U.S. | 250 | NASA/RSA | <0.75 | <0.75 | 13.3 |
| **Cations (CE/IC)** | | | | | | | |
| Ammonia as Nitrogen (NH3-N) | mg/L | U.S. | 2 | NASA/RSA | <0.002 | <0.002 | <0.002 |
| Calcium | mg/L | U.S. | 100 | NASA/RSA | 17.30 | 6.83 | 26.40 |
| Lithium | mg/L | U.S. | | | <0.002 | <0.002 | <0.002 |
| Magnesium | mg/L | U.S. | 50 | NASA/RSA | 2.41 | 0.786 | 5.970 |
| Potassium | mg/L | U.S. | | | <0.002 | <0.002 | 1.55 |
| Sodium | mg/L | U.S. | | | 0.219 | 0.057 | 3.79 |
| **Minerals** | | | | | | | |
| Ammonium (NH4) | mg/L | Russia | 2 | NASA/RSA | 0.20 | 0.30 | NA |
| Calcium | mg/L | Russia | 100 | NASA/RSA | NA | NA | NA |
| Magnesium | mg/L | Russia | 50 | NASA/RSA | NA | NA | NA |
| **Metals** | | | | | | | |
| Calcium | µg/L | U.S. | 100000 | NASA/RSA | NA | NA | NA |
| Magnesium | µg/L | U.S. | 50000 | NASA/RSA | NA | NA | NA |

## TABLE 4. REGENERATED WATER RESULTS

| Mission<br>Sample Location<br>Sample Description<br><br>Sample Date<br>Analysis/Sample ID | Units | Test Conducted by | Maximum Contaminant Level (MCL) | Maximum Contaminant Level Source | Mir 24 galley-hot regenerated water 11/17/97 98-0202-01 | Mir 24 galley-hot regenerated water 11/27/97 98-0202-03 | Mir 24 galley-hot regenerated water 1/19/98 98-0202-04 |
|---|---|---|---|---|---|---|---|
| **Metals contd.** | | | | | | | |
| Sodium | µg/L | U.S. | | | NA | NA | NA |
| Potassium | µg/L | U.S. | | | NA | NA | NA |
| Silver | µg/L | U.S. | 500 | NASA/RSA | 83.0 | 61.6 | 236.0 |
| Silver ion | µg/L | Russia | | | NA | NA | NA |
| Aluminum | µg/L | U.S. | | NASA | 3.4 | 4.2 | 15.5 |
| Arsenic | µg/L | U.S. | 10 | NASA | ND | ND | ND |
| Barium | µg/L | U.S. | 1000 | NASA | 3.6 | 1.4 | 31.6 |
| Cadmium | µg/L | U.S. | 5 | NASA | ND | ND | ND |
| Chromium | µg/L | U.S. | 100 | NASA | ND | ND | ND |
| Cobalt | µg/L | U.S. | | NASA | ND | ND | ND |
| Copper | µg/L | U.S. | 1000 | NASA | 13.4 | 10.7 | 20.7 |
| Iron | µg/L | U.S. | 300 | NASA | 58.3 | 32.4 | 99.1 |
| Mercury | µg/L | U.S. | 2 | NASA | ND | ND | ND |
| Manganese | µg/L | U.S. | 50 | NASA | ND | 1.3 | 23.1 |
| Molybdenum | µg/L | U.S. | | NASA | ND | ND | ND |
| Nickel | µg/L | U.S. | 100 | NASA | 8.2 | 8.9 | 66.4 |
| Lead | µg/L | U.S. | 50 | NASA | ND | ND | 5.5 |
| Selenium | µg/L | U.S. | 10 | NASA | ND | ND | ND |
| Zinc | µg/L | U.S. | 5000 | NASA | 10.4 | 19.1 | 117.0 |
| Palladium | µg/L | U.S. | | NASA | NA | NA | NA |
| Silicon | µg/L | U.S. | | NASA | NA | NA | NA |
| Tungsten | µg/L | U.S. | | | NA | NA | NA |
| **Total Organic Carbon** | | | | | | | |
| TIC (OI 1010) | mg/L | U.S. | | | NA | NA | NA |
| POC (OI 1010) | mg/L | U.S. | | | NA | NA | NA |
| NPOC (OI 1010) | mg/L | U.S. | | | NA | NA | NA |
| TOC (OI 1010) | mg/L | U.S. | 0.5/25 | NASA/RSA | NA | NA | NA |
| **Total Organic Carbon** | | | | | | | |
| TIC (Sievers 800) | mg/L | U.S. | | | 5.38 | 4.98 | 18.9 |
| TOC (Sievers 800) | mg/L | U.S. | 0.5/25 | NASA/RSA | 11.1 | 3.11 | 5.79 |
| TOC (Sievers 800) | mg/L | Russia | 0.5/25 | NASA/RSA | 23.2 | 4.8 | 22.8 |

## TABLE 4. REGENERATED WATER RESULTS

| **Mission**<br>**Sample Location**<br>**Sample Description**<br><br>**Sample Date**<br>**Analysis/Sample ID** | **Units** | **Test Conducted by** | **Maximum Contaminant Level (MCL)** | **Maximum Contaminant Level Source** | **Mir 24** galley-hot regenerated water 11/17/97 **98-0202-01** | **Mir 24** galley-hot regenerated water 11/27/97 **98-0202-03** | **Mir 24** galley-hot regenerated water 1/19/98 **98-0202-04** |
|---|---|---|---|---|---|---|---|
| **Volatile Organics** | | | | | | | |
| Acetaldehyde | µg/L | U.S. | | | NA | NA | NA |
| Acetone | µg/L | U.S. | | | 52 | ND | ND |
| Acryloniltrile | µg/L | U.S. | | | ND | ND | ND |
| Allyl chloride | ND | U.S. | | | ND | ND | ND |
| Benzene | µg/L | U.S. | 5.0 | EPA | ND | ND | ND |
| Bromobenzene | µg/L | U.S. | | | ND | ND | ND |
| Bromochloromethane | µg/L | U.S. | 50.0 | EPA DWEL | ND | ND | ND |
| Bromodichloromethane | µg/L | U.S. | 100 | EPA | ND | ND | ND |
| Bromoform | µg/L | U.S. | 100 | EPA | ND | ND | ND |
| Bromomethane | µg/L | U.S. | 10 | EPA HA | ND | ND | ND |
| 2-Butanone | µg/L | U.S. | | | ND | ND | ND |
| n-Butylbenzene | µg/L | U.S. | | | ND | ND | ND |
| s-Butylbenzene | µg/L | U.S. | | | ND | ND | ND |
| t-Butylbenzene | µg/L | U.S. | | | ND | ND | ND |
| Carbon disulfide | µg/L | U.S. | | | <5.00 | <5.00 | <10.00 |
| Carbon tetrachloride | µg/L | U.S. | 5 | EPA | ND | ND | ND |
| Chloroacetonitrile | µg/L | U.S. | | | ND | ND | ND |
| Chlorobenzene | µg/L | U.S. | 100 | EPA | ND | ND | ND |
| 1-Chlorobutane | µg/L | U.S. | | | ND | ND | ND |
| Chloroethane | µg/L | U.S. | | | ND | ND | ND |
| Chloroform | µg/L | U.S. | 100 | EPA | ND | ND | 37.04 |
| Chloromethane | µg/L | U.S. | 3 | EPA HA | ND | ND | ND |
| 2-Chlorotoluene | µg/L | U.S. | 100 | EPA HA | ND | ND | ND |
| 4-Chlorotoluene | µg/L | U.S. | 100 | EPA HA | ND | ND | ND |
| Dibromochloromethane | µg/L | U.S. | 100 | EPA | ND | ND | ND |
| 1,2-Dibromo-3-chloropropane | µg/L | U.S. | 0.2 | EPA | ND | ND | ND |
| 1,2-Dibromoethane | µg/L | U.S. | 0.05 | EPA | ND | ND | ND |
| Dibromomethane | µg/L | U.S. | | | ND | ND | ND |
| 1,2-Dichlorobenzene | µg/L | U.S. | 600 | EPA | ND | ND | ND |
| 1,3-Dichlorobenzene | µg/L | U.S. | 600 | EPA | ND | ND | ND |
| 1,4-Dichlorobenzene | µg/L | U.S. | 75 | EPA | ND | ND | ND |
| trans-1,4-dichloro-2-butene | µg/L | U.S. | | | ND | ND | ND |
| Dichlorodifluoromethane | µg/L | U.S. | 1000 | EPA HA | ND | ND | ND |

## TABLE 4. REGENERATED WATER RESULTS

| Mission<br>Sample Location<br>Sample Description<br><br>Sample Date<br>Analysis/Sample ID | Units | Test Conducted by | Maximum Contaminant Level (MCL) | Maximum Contaminant Level Source | Mir 24 galley-hot regenerated water 11/17/97 98-0202-01 | Mir 24 galley-hot regenerated water 11/27/97 98-0202-03 | Mir 24 galley-hot regenerated water 1/19/98 98-0202-04 |
|---|---|---|---|---|---|---|---|
| **Volatile Organics contd.** | | | | | | | |
| 1,1-Dichloroethane | µg/L | U.S. | | | ND | ND | ND |
| 1,2-Dichloroethane | µg/L | U.S. | 5 | EPA | ND | ND | ND |
| 1,1-Dichloroethene | µg/L | U.S. | 7 | EPA | ND | ND | ND |
| cis1,2-dichloroethene | µg/L | U.S. | 70 | EPA | ND | ND | ND |
| trans-1,2-dichloroethene | µg/L | U.S. | 100 | EPA | ND | ND | ND |
| 1,2-Dichloropropane | µg/L | U.S. | 5 | EPA | ND | ND | ND |
| 1,3-Dichloropropane | µg/L | U.S. | | | ND | ND | ND |
| 2,2-Dichloropropane | µg/L | U.S. | | | ND | ND | ND |
| 1,2-Dichloropropene | µg/L | U.S. | | | ND | ND | ND |
| cis-1,3-Dichloropropene | µg/L | U.S. | | | ND | ND | ND |
| trans-1,3-Dichloropropene | µg/L | U.S. | | | ND | ND | ND |
| Diethyl ether | µg/L | U.S. | | | ND | ND | ND |
| Ethylbenzene | µg/L | U.S. | | | ND | ND | ND |
| Ethyl methacylate | µg/L | U.S. | | | ND | ND | ND |
| Hexachlorobutadiene | µg/L | U.S. | | | ND | ND | ND |
| 2-Hexanone | µg/L | U.S. | | | ND | ND | ND |
| Iodomethane | µg/L | U.S. | | | ND | ND | ND |
| Isopropylbenzene | µg/L | U.S. | | | ND | ND | ND |
| 4-Isopropyltoluene | µg/L | U.S. | | | ND | ND | ND |
| Linolool | µg/L | U.S. | | | NA | NA | NA |
| Methacrylonitrile | µg/L | U.S. | | | ND | ND | ND |
| Methylacrylate | µg/L | U.S. | | | ND | ND | ND |
| Methyl-t-butylether | µg/L | U.S. | 20 | EPA HA | ND | ND | ND |
| Methylene chloride | µg/L | U.S. | 5 | EPA | ND | ND | ND |
| Methylmethacrylate | µg/L | U.S. | | | ND | ND | ND |
| 4-Methyl-2-pentanone | µg/L | U.S. | | | ND | ND | ND |
| alpha-Methyl styrene | µg/L | U.S. | | | NA | ND | ND |
| Perfluoro-1,3-dimethylcyclohexane | µg/L | U.S. | | | NA | ND | ND |
| Tetrahydrofuran | µg/L | U.S. | | | ND | ND | ND |
| Toluene | µg/L | U.S. | | | ND | ND | ND |
| m&p-Xylene | µg/L | U.S. | Total Xylenes 10000 | EPA | ND | ND | ND |
| o-Xylene | µg/L | U.S. | Total Xylenes 10000 | EPA | <1.00 | ND | ND |

## TABLE 4. REGENERATED WATER RESULTS

| Mission<br>Sample Location<br>Sample Description<br><br>Sample Date<br>Analysis/Sample ID | Units | Test Conducted by | Maximum Contaminant Level (MCL) | Maximum Contaminant Level Source | Mir 24 galley-hot regenerated water 11/17/97 98-0202-01 | Mir 24 galley-hot regenerated water 11/27/97 98-0202-03 | Mir 24 galley-hot regenerated water 1/19/98 98-0202-04 |
|---|---|---|---|---|---|---|---|
| **Extractable Organics** | | | | | | | |
| Acetophenone | µg/L | U.S. | | | ND | ND | ND |
| 2-Aminonaphthalene | µg/L | U.S. | | | ND | ND | ND |
| Aniline | µg/L | U.S. | | | ND | ND | ND |
| Azobenzene | µg/L | U.S. | | | ND | ND | ND |
| 2,2′-Azobis-isobutyronitrile | µg/L | U.S. | | | ND | ND | ND |
| Benzaldehyde | µg/L | U.S. | | | ND | ND | ND |
| Benzoic acid | µg/L | U.S. | | | ND | ND | ND |
| Benzothiazole | µg/L | U.S. | | | ND | <4 | ND |
| Benzyl alcohol | µg/L | U.S. | | | ND | 5 | ND |
| Benzyl butyl phthlate | µg/L | U.S. | 7000 | EPA DWEL | ND | ND | ND |
| 2-Butoxyethanol | µg/L | U.S. | | | ND | ND | ND |
| 2-(2-Butoxyethoxy)ethanol | µg/L | U.S. | | | ND | ND | ND |
| 2-(2-Butoxyethoxy)ethyl acetate | µg/L | U.S. | | | ND | ND | ND |
| n-Butylpalmitate | µg/L | U.S. | | | ND | <8 | ND |
| Butylated hydroxyanisole (BHA) | µg/L | U.S. | | | ND | ND | ND |
| N-Butylbenzenesulfonamide | µg/L | U.S. | | | ND | ND | ND |
| 3-tert-Butylphenol | µg/L | U.S. | | | ND | ND | ND |
| Caffeine | µg/L | U.S. | | | ND | ND | ND |
| Caprolactam | µg/L | U.S. | | | ND | ND | ND |
| tris-2-Chloroethyl phosphate | µg/L | U.S. | | | ND | ND | ND |
| Cyclododecane | µg/L | U.S. | | | ND | ND | ND |
| Cyclohexanone | µg/L | U.S. | | | ND | ND | ND |
| Decamethylcyclopentasiloxane | µg/L | U.S. | | | ND | ND | ND |
| 1,4 Diacetylbenzene | µg/L | U.S. | | | ND | ND | ND |
| 1,3- Dichlorobenzene | µg/L | U.S. | 600 | EPA | ND | ND | ND |
| 1,4-Dichlorobenzene | µg/L | U.S. | 75 | EPA | ND | ND | ND |
| Di-n-butylamine | µg/L | U.S. | | | ND | ND | ND |
| Diallyl Phthalate | µg/L | U.S. | | | ND | ND | ND |
| Di-n-butyl phthalate | µg/L | U.S. | 4000 | EPA DWEL | ND | ND | ND |
| N,N-Dibutylformamide | µg/L | U.S. | | | ND | ND | ND |
| 2,6-Di-t-butyl-1,4-benzoquinone | µg/L | U.S. | | | ND | ND | ND |
| 3,5-Di-t-butyl-4-hydroxybenzaldehyde | µg/L | U.S. | | | ND | ND | ND |

## TABLE 4. REGENERATED WATER RESULTS

| Mission<br>Sample Location<br>Sample Description<br><br>Sample Date<br>Analysis/Sample ID | Units | Test Conducted by | Maximum Contaminant Level (MCL) | Maximum Contaminant Level Source | Mir 24 galley-hot regenerated water 11/17/97 98-0202-01 | Mir 24 galley-hot regenerated water 11/27/97 98-0202-03 | Mir 24 galley-hot regenerated water 1/19/98 98-0202-04 |
|---|---|---|---|---|---|---|---|
| **Extractable Organics contd.** | | | | | | | |
| 2,6-Di-t-butyl-4-methylphenol | µg/L | U.S. | | | ND | ND | ND |
| 2,4-Di-t-butylphenol | µg/L | U.S. | | | ND | ND | ND |
| Dicyclohexyl | µg/L | U.S. | | | ND | ND | ND |
| N,N-Diethylformamide | µg/L | U.S. | | | ND | ND | ND |
| N,N-Diethyl-m-toluamide | µg/L | U.S. | | | ND | ND | ND |
| Diethylene glycol di-n-butyl ether | µg/L | U.S. | | | ND | ND | ND |
| Diethylene glycol monoethyl ether | µg/L | U.S. | | | ND | ND | ND |
| Diethyl phthalate | µg/L | U.S. | 5000 | EPA HA | ND | ND | ND |
| Diisopropyl Adipate | µg/L | U.S. | | | ND | ND | ND |
| N,N-Dimethylacetamide | µg/L | U.S. | | | ND | ND | ND |
| N,N-Dimethylbenzylamine | µg/L | U.S. | | | ND | ND | ND |
| Dimethylcarbamyl chloride | µg/L | U.S. | | | ND | ND | ND |
| N,N-Dimethylformamide | µg/L | U.S. | | | ND | ND | ND |
| Dimethyl phthalate | µg/L | U.S. | | | ND | ND | ND |
| Dimethylthiocarbamoyl chloride | µg/L | U.S. | | | ND | ND | ND |
| Dipropylene glycol methyl ether | µg/L | U.S. | | | ND | ND | ND |
| Dodecamethylcyclohexasiloxane | µg/L | U.S. | | | ND | ND | ND |
| Dodecanoic acid | µg/L | U.S. | | | ND | ND | ND |
| Eicosane | µg/L | U.S. | | | ND | ND | ND |
| 2-Ethoxyethanol | µg/L | U.S. | | | ND | ND | ND |
| 2-Ethylhexanoic acid | µg/L | U.S. | | | ND | ND | ND |
| 2-Ethyl-1-hexanol | µg/L | U.S. | | | ND | 6.7 | ND |
| bis-2-Ethylhexyl adipate | µg/L | U.S. | 400 | EPA | ND | ND | ND |
| bis-2-Ethylhexyl phthalate (Dioctyl phthlate) | µg/L | U.S. | 6 | EPA HA | ND | ND | ND |
| 4-Ethylmorpholine | µg/L | U.S. | | | ND | ND | ND |
| 4-Ethylphenol | µg/L | U.S. | | | ND | ND | ND |
| 1-Formylpiperidine | µg/L | U.S. | | | ND | ND | ND |
| Heneicosane | µg/L | U.S. | | | ND | ND | ND |
| 2-Heptanone | µg/L | U.S. | | | ND | ND | ND |
| Hexanoic acid | µg/L | U.S. | | | ND | ND | ND |
| 2-Hexanol | µg/L | U.S. | | | ND | ND | ND |
| Hexanamide | µg/L | U.S. | | | ND | ND | ND |
| Hydrocinnamic acid | µg/L | U.S. | | | ND | ND | ND |

## TABLE 4. REGENERATED WATER RESULTS

| Mission<br>Sample Location<br>Sample Description<br><br>Sample Date<br>Analysis/Sample ID | Units | Test Conducted by | Maximum Contaminant Level (MCL) | Maximum Contaminant Level Source | Mir 24 galley-hot regenerated water 11/17/97 98-0202-01 | Mir 24 galley-hot regenerated water 11/27/97 98-0202-03 | Mir 24 galley-hot regenerated water 1/19/98 98-0202-04 |
|---|---|---|---|---|---|---|---|
| **Extractable Organics contd.** | | | | | | | |
| 2-Hydroxybenzothiazole | µg/L | U.S. | | | ND | ND | ND |
| 4-Hydroxy-4-methyl-2-pentanone | µg/L | U.S. | | | ND | ND | ND |
| Indole | µg/L | U.S. | | | ND | ND | ND |
| Isophorone | µg/L | U.S. | 100 | EPA HA | ND | ND | ND |
| Isophorone | µg/L | U.S. | | | ND | ND | ND |
| Limonene | µg/L | U.S. | | | ND | ND | ND |
| Menthol | µg/L | U.S. | | | ND | ND | ND |
| Menthone | µg/L | U.S. | | | ND | ND | ND |
| 2-Mercaptobenzothiazole | µg/L | U.S. | | | ND | ND | ND |
| 2,2′-Methylenebis(6-t-butyl-4-ethylphenol) | µg/L | U.S. | | | ND | ND | ND |
| 3-Methyl-2-cyclohexen-1-one | µg/L | U.S. | | | ND | ND | ND |
| Methyl-4-hydroxybenzoate | µg/L | U.S. | | | ND | ND | ND |
| 3-Methylindole | µg/L | U.S. | | | ND | ND | ND |
| 2-Methyl-2,4-pentanediol | µg/L | U.S. | | | ND | ND | ND |
| 2-Methylphenol | µg/L | U.S. | | | ND | ND | ND |
| 4-Methylphenol | µg/L | U.S. | | | ND | ND | ND |
| 2-Methylpyrazine | µg/L | U.S. | | | ND | ND | ND |
| 1-Methyl-2-pyrrolidinone | µg/L | U.S. | | | ND | ND | ND |
| Methyl sulfone | µg/L | U.S. | | | ND | ND | ND |
| 2-Methylthiobenzothiazole | µg/L | U.S. | | | ND | <4 | ND |
| Monomethyl phthalate | µg/L | U.S. | | | ND | ND | ND |
| Neomenthol | µg/L | U.S. | | | ND | ND | ND |
| Nicotine | µg/L | U.S. | | | ND | ND | ND |
| Nonadecane | µg/L | U.S. | | | ND | ND | ND |
| Octadecanol | µg/L | U.S. | | | ND | ND | ND |
| Octamethylcyclotetrasiloxane | µg/L | U.S. | | | ND | ND | ND |
| Octanoic Acid | µg/L | U.S. | | | ND | ND | ND |
| 4-t-Octylphenol | µg/L | U.S. | | | ND | ND | ND |
| Oxindole | µg/L | U.S. | | | ND | ND | ND |
| Pentacosane | µg/L | U.S. | | | ND | <4 | ND |
| s-Phenethyl alcohol | µg/L | U.S. | | | ND | ND | ND |
| Phenol | µg/L | U.S. | 1/4000 | NASA/EPA HA | ND | ND | ND |
| bis-Phenol A | µg/L | U.S. | | | ND | ND | ND |

## TABLE 4. REGENERATED WATER RESULTS

| Mission<br>Sample Location<br>Sample Description<br><br>Sample Date<br>Analysis/Sample ID | Units | Test Conducted by | Maximum Contaminant Level (MCL) | Maximum Contaminant Level Source | Mir 24 galley-hot regenerated water 11/17/97 98-0202-01 | Mir 24 galley-hot regenerated water 11/27/97 98-0202-03 | Mir 24 galley-hot regenerated water 1/19/98 98-0202-04 |
|---|---|---|---|---|---|---|---|
| **Extractable Organics contd.** | | | | | | | |
| Phenoxyacetic acid | µg/L | U.S. | | | ND | ND | ND |
| 2-Phenoxyethanol | µg/L | U.S. | | | ND | ND | ND |
| N-Phenyl-2-naphthylamine | µg/L | U.S. | | | ND | ND | ND |
| 2-Phenylacetic Acid | µg/L | U.S. | | | ND | ND | ND |
| Phenylethyl alcohol | µg/L | U.S. | | | ND | ND | ND |
| 2-Phenylphenol | µg/L | U.S. | | | ND | ND | ND |
| 2-Phenyl-2-propanol | µg/L | U.S. | | | ND | ND | ND |
| Phenyl sulfone | µg/L | U.S. | | | ND | ND | ND |
| Phthalide | µg/L | U.S. | | | ND | ND | ND |
| Salicyclic Acid | µg/L | U.S. | | | ND | ND | ND |
| Squalene | µg/L | U.S. | | | ND | ND | ND |
| 1-alpha-Terpineol | µg/L | U.S. | | | ND | ND | ND |
| 1-Tetradecanol | µg/L | U.S. | | | ND | ND | ND |
| Tetramethylsuccinonitrile | µg/L | U.S. | | | ND | ND | ND |
| Tetramethylthiourea | µg/L | U.S. | | | ND | ND | ND |
| Tetramethylurea | µg/L | U.S. | | | ND | ND | ND |
| Thymol | µg/L | U.S. | | | ND | ND | ND |
| o-Toluic acid | µg/L | U.S. | | | ND | ND | ND |
| 1,3,5-Triallyl-1,3,5-triazine-2,4,6(1H,3H,5H)-trione | µg/L | U.S. | | | ND | ND | ND |
| Tricosane | µg/L | U.S. | | | ND | ND | ND |
| Tributyl Phosphate | µg/L | U.S. | | | ND | ND | ND |
| Triethyl Phosphate | µg/L | U.S. | | | ND | ND | ND |
| Triethylamine | µg/L | U.S. | | | ND | ND | ND |
| 2,2,4-Trimethyl-1,3-pentanediol diisobutyrate | µg/L | U.S. | | | ND | <8 | ND |
| Undecanoic Acid | µg/L | U.S. | | | ND | ND | ND |
| 2-Undecanone | µg/L | U.S. | | | ND | ND | ND |
| Urethane | µg/L | U.S. | | | ND | ND | ND |
| Vanillin | µg/L | U.S. | | | ND | ND | ND |
| **Alcohols (DAI/GC/MS)** | | | | | | | |
| Ethanol | µg/L | U.S. | | | 1129 | ND | ND |
| Methanol | µg/L | U.S. | | | ND | ND | ND |

## TABLE 4. REGENERATED WATER RESULTS

| Mission<br>Sample Location<br>Sample Description<br>Sample Date<br>Analysis/Sample ID | Units | Test Conducted by | Maximum Contaminant Level (MCL) | Maximum Contaminant Level Source | Mir 24 galley-hot regenerated water 11/17/97 98-0202-01 | Mir 24 galley-hot regenerated water 11/27/97 98-0202-03 | Mir 24 galley-hot regenerated water 1/19/98 98-0202-04 |
|---|---|---|---|---|---|---|---|
| **Alcohols (DAI/GC/MS) contd.** | | | | | | | |
| 1-Methoxy-2-propanol | µg/L | U.S. | | | ND | ND | ND |
| 2-Methyl-2-butanol | µg/L | U.S. | | | ND | ND | ND |
| 2-Methyl-2-propanol | µg/L | U.S. | | | ND | ND | ND |
| 2-Propanol | µg/L | U.S. | | | ND | ND | ND |
| **Alcohols/Acetone** | | | | | | | |
| Acetone | µg/L | Russia | | | ND | ND | ND |
| Butanol | µg/L | Russia | | | ND | ND | ND |
| Ethanol | µg/L | Russia | | | ND | ND | ND |
| Isoamyl alcohol | µg/L | Russia | | | ND | ND | ND |
| Methanol | µg/L | Russia | | | ND | ND | ND |
| Propanol | µg/L | Russia | | | ND | ND | ND |
| **Glycols (DAI/GC/MS)** | | | | | | | |
| 1,2-Ethanediol | µg/L | U.S. | 7000 | EPA HA | ND | ND | ND |
| 1,2-Propanediol | µg/L | U.S. | | | ND | ND | ND |
| **Glycols** | | | | | | | |
| 1,2-Ethanediol | µg/L | Russia | 7000 | EPA HA | ND | ND | ND |
| 1,2-Propanediol | µg/L | Russia | | | NA | NA | NA |
| **Organic Acids (SPE/GC/MS)** | | | | | | | |
| Acetic acid | µg/L | U.S. | | | NA | NA | NA |
| Acetic acid | µg/L | Russia | | | ND | ND | ND |
| Lactic acid | µg/L | U.S. | | | NA | NA | NA |
| Propionic acid | µg/L | U.S. | | | NA | NA | NA |
| **Aldehydes** | | | | | | | |
| Acetaldehyde | µg/L | U.S. | | | NA | NA | NA |
| Formaldehyde | µg/L | U.S. | 1000 | EPA HA | 2.3 | <2 | <2 |
| **Carboxylates (CE)** | | | | | | | |
| Acetate | mg/L | U.S. | | | <0.12 | <0.12 | <0.12 |
| Butyrate | mg/L | U.S. | | | NA | NA | NA |
| Formate | mg/L | U.S. | | | 26.8 | 5.3 | <0.12 |
| Glycolate | mg/L | U.S. | | | <0.12 | <0.12 | <0.12 |
| Glyoxylate | mg/L | U.S. | | | <0.12 | <0.12 | <0.12 |
| Lactate | mg/L | U.S. | | | 0.45 | <0.12 | <0.12 |
| Propionate | mg/L | U.S. | | | <0.12 | <0.12 | <0.12 |
| Oxalate | mg/L | U.S. | | | <0.12 | <0.12 | <0.12 |

## TABLE 4. REGENERATED WATER RESULTS

| **Mission**<br>**Sample Location**<br>**Sample Description**<br><br>**Sample Date**<br>**Analysis/Sample ID** | **Units** | **Test Conducted by** | **Maximum Contaminant Level (MCL)** | **Maximum Contaminant Level Source** | **Mir 24**<br>galley-hot regenerated water<br>11/17/97<br>**98-0202-01** | **Mir 24**<br>galley-hot regenerated water<br>11/27/97<br>**98-0202-03** | **Mir 24**<br>galley-hot regenerated water<br>1/19/98<br>**98-0202-04** |
|---|---|---|---|---|---|---|---|
| **Amines (CE)** | | | | | | | |
| Ethylamine | mg/L | U.S. | | | <0.12 | <0.12 | <0.12 |
| Methylamine | mg/L | U.S. | | | <0.12 | <0.12 | <0.12 |
| Propylamine | mg/L | U.S. | | | <0.12 | <0.12 | <0.12 |
| Trimethylamine | mg/L | U.S. | | | <0.12 | <0.12 | <0.12 |
| **Urea** | mg/L | U.S. | | | ND | ND | ND |
| **Organic Carbon Recovery** | percent | U.S. | | | 70.25 | 44.98 | 0.07 |

ND = not detected
NA = not analyzed
DWEL = Drinking Water Equivalent Level
HA = Health Advisory

# TABLE 5. STORED WATER RESULTS

| **Mission**<br>**Sample Location**<br>**Sample Description**<br>**Sample Date**<br>**Analysis/Sample ID** | **Units** | **Test Conducted by** | **Maximum Contaminant Level (MCL)** | **Maximum Contaminant Level Source** | **Mir 24**<br>SVO-ZV<br>stored water<br>11/27/97<br>**98-0202-06** |
|---|---|---|---|---|---|
| **Conductivity** | µS/cm | U.S. | | | 195 |
| **Conductivity** | µS/cm | Russia | | | 175 |
| **pH** | pH units | U.S. | 5.5-9.0 | NASA/RSA | 7.16 |
| **pH** | pH units | Russia | 5.5-9.0 | NASA/RSA | 7.3 |
| **Turbidity** | NTU | U.S. | 1 | NASA/RSA | 1.66 |
| **Turbidity** | mg/L | Russia | 1.5 | NASA/RSA | 0.0 |
| **Color True** | degrees | Russia | 15 Pt-Co units/20 | NASA/RSA | 10 |
| **Odor at 20°C** | grade | Russia | 3 TON/2 | NASA/RSA | 0 |
| **Taste at 20°C** | grade | Russia | 3 TTN/2 | NASA/RSA | NA |
| **Total Solids** | mg/L | Russia | 1.5 | NASA/RSA | NA |
| **Total Hardness** | meq/L | Russia | 7 | NASA/RSA | 1.9 |
| **Chemical Oxygen Demand** | mg $O_2$/L | Russia | no limit/100 | NASA/RSA | 25 |
| **Anions (CE/IC)** | | | | | |
| Bromide | mg/L | U.S. | | | <0.50 |
| Chloride | mg/L | U.S. | 200 | NASA/RSA | <0.15 |
| Fluoride | mg/L | U.S. | 1.5 | NASA/RSA | 0.26 |
| Nitrate as Nitrogen (NO3-N) | mg/L | U.S. | 10 | NASA/RSA | <0.11 |
| Nitrite as Nitrogen (NO2-N) | mg/L | U.S. | | | <0.08 |
| Phosphate | mg/L | U.S. | | | <0.24 |
| Sulfate | mg/L | U.S. | 250 | NASA/RSA | <0.75 |
| **Cations (CE/IC)** | | | | | |
| Ammonia as Nitrogen (NH3-N) | mg/L | U.S. | 2 | NASA/RSA | <0.002 |
| Calcium | mg/L | U.S. | 100 | NASA/RSA | 28.7 |
| Lithium | mg/L | U.S. | | | <0.002 |
| Magnesium | mg/L | U.S. | 50 | NASA/RSA | 5.05 |
| Potassium | mg/L | U.S. | | | <0.002 |
| Sodium | mg/L | U.S. | | | 0.51 |
| **Minerals** | | | | | |
| Ammonium (NH4) | mg/L | Russia | 2 | NASA/RSA | 0.2 |
| Calcium | mg/L | Russia | 100 | NASA/RSA | NA |
| Magnesium | mg/L | Russia | 50 | NASA/RSA | NA |
| **Metals** | | | | | |
| Calcium | µg/L | U.S. | 100000 | NASA/RSA | NA |
| Magnesium | µg/L | U.S. | 50000 | NASA/RSA | NA |
| Sodium | µg/L | U.S. | | | NA |
| Potassium | µg/L | U.S. | | | NA |
| Silver | µg/L | U.S. | 500 | NASA/RSA | 330 |
| Silver ion | µg/L | Russia | | | NA |
| Aluminum | µg/L | U.S. | | NASA | 1.5 |
| Arsenic | µg/L | U.S. | 10 | NASA | ND |
| Barium | µg/L | U.S. | 1000 | NASA | 6.2 |
| Cadmium | µg/L | U.S. | 5 | NASA | 5.6 |
| Chromium | µg/L | U.S. | 100 | NASA | ND |
| Cobalt | µg/L | U.S. | | NASA | ND |
| Copper | µg/L | U.S. | 1000 | NASA | ND |
| Iron | µg/L | U.S. | 300 | NASA | 103.0 |
| Mercury | µg/L | U.S. | 2 | NASA | ND |
| Manganese | µg/L | U.S. | 50 | NASA | ND |
| Molybdenum | µg/L | U.S. | | NASA | ND |
| Nickel | µg/L | U.S. | 100 | NASA | 1.2 |
| Lead | µg/L | U.S. | 50 | NASA | ND |

# TABLE 5. STORED WATER RESULTS

| Mission<br>Sample Location<br>Sample Description<br>Sample Date<br>Analysis/Sample ID | Units | Test Conducted by | Maximum Contaminant Level (MCL) | Maximum Contaminant Level Source | Mir 24<br>SVO-ZV<br>stored water<br>11/27/97<br>98-0202-06 |
|---|---|---|---|---|---|
| **Metals contd.** | | | | | |
| Selenium | µg/L | U.S. | 10 | NASA | ND |
| Zinc | µg/L | U.S. | 5000 | NASA | 29.4 |
| Palladium | µg/L | U.S. | | NASA | NA |
| Silicon | µg/L | U.S. | | NASA | NA |
| Tungsten | µg/L | U.S. | | | NA |
| **Total Organic Carbon** | | | | | |
| TIC (OI 1010) | mg/L | U.S. | | | NA |
| POC (OI 1010) | mg/L | U.S. | | | NA |
| NPOC (OI 1010) | mg/L | U.S. | | | NA |
| TOC (OI 1010) | mg/L | U.S. | 0.5/25 | NASA/RSA | NA |
| TIC (Sievers 800) | mg/L | U.S. | | | 9.67 |
| TOC (Sievers 800) | mg/L | U.S. | 0.5/25 | NASA/RSA | 20.0 |
| TOC (Sievers 800) | mg/L | Russia | 0.5/25 | NASA/RSA | 19.9 |
| **Volatile Organics** | | | | | |
| Acetaldehyde | µg/L | U.S. | | | NA |
| Acetone | µg/L | U.S. | | | 230.22 |
| Acryloniltrile | µg/L | U.S. | | | ND |
| Allyl chloride | ND | U.S. | | | ND |
| Benzene | µg/L | U.S. | 5.0 | EPA | ND |
| Bromobenzene | µg/L | U.S. | | | ND |
| Bromochloromethane | µg/L | U.S. | 50.0 | EPA DWEL | ND |
| Bromodichloromethane | µg/L | U.S. | 100 | EPA | ND |
| Bromoform | µg/L | U.S. | 100 | EPA | ND |
| Bromomethane | µg/L | U.S. | 10 | EPA HA | ND |
| 2-Butanone | µg/L | U.S. | | | ND |
| n-Butylbenzene | µg/L | U.S. | | | ND |
| s-Butylbenzene | µg/L | U.S. | | | ND |
| t-Butylbenzene | µg/L | U.S. | | | ND |
| Carbon disulfide | µg/L | U.S. | | | <5.00 |
| Carbon tetrachloride | µg/L | U.S. | 5 | EPA | ND |
| Chloroacetonitrile | µg/L | U.S. | | | ND |
| Chlorobenzene | µg/L | U.S. | 100 | EPA | ND |
| 1-Chlorobutane | µg/L | U.S. | | | ND |
| Chloroethane | µg/L | U.S. | | | ND |
| Chloroform | µg/L | U.S. | 100 | EPA | ND |
| Chloromethane | µg/L | U.S. | 3 | EPA HA | ND |
| 2-Chlorotoluene | µg/L | U.S. | 100 | EPA HA | ND |
| 4-Chlorotoluene | µg/L | U.S. | 100 | EPA HA | ND |
| Dibromochloromethane | µg/L | U.S. | 100 | EPA | ND |
| 1,2-Dibromo-3-chloropropane | µg/L | U.S. | 0.2 | EPA | ND |
| 1,2-Dibromoethane | µg/L | U.S. | 0.05 | EPA | ND |
| Dibromomethane | µg/L | U.S. | | | ND |
| 1,2-Dichlorobenzene | µg/L | U.S. | 600 | EPA | ND |
| 1,3-Dichlorobenzene | µg/L | U.S. | 600 | EPA | ND |
| 1,4-Dichlorobenzene | µg/L | U.S. | 75 | EPA | ND |
| trans-1,4-dichloro-2-butene | µg/L | U.S. | | | ND |
| Dichlorodifluoromethane | µg/L | U.S. | 1000 | EPA HA | ND |
| 1,1-Dichloroethane | µg/L | U.S. | | | ND |
| 1,2-Dichloroethane | µg/L | U.S. | 5 | EPA | ND |
| 1,1-Dichloroethene | µg/L | U.S. | 7 | EPA | ND |

# TABLE 5. STORED WATER RESULTS

| Mission<br>Sample Location<br>Sample Description<br>Sample Date<br>Analysis/Sample ID | Units | Test Conducted by | Maximum Contaminant Level (MCL) | Maximum Contaminant Level Source | Mir 24<br>SVO-ZV<br>stored water<br>11/27/97<br>98-0202-06 |
|---|---|---|---|---|---|
| **Volatile Organics contd.** | | | | | |
| cis1,2-dichloroethene | µg/L | U.S. | 70 | EPA | ND |
| trans-1,2-dichloroethene | µg/L | U.S. | 100 | EPA | ND |
| 1,2-Dichloropropane | µg/L | U.S. | 5 | EPA | ND |
| 1,3-Dichloropropane | µg/L | U.S. | | | ND |
| 2,2-Dichloropropane | µg/L | U.S. | | | ND |
| 1,2-Dichloropropene | µg/L | U.S. | | | ND |
| cis-1,3-Dichloropropene | µg/L | U.S. | | | ND |
| trans-1,3-Dichloropropene | µg/L | U.S. | | | ND |
| Diethyl ether | µg/L | U.S. | | | ND |
| Ethylbenzene | µg/L | U.S. | | | ND |
| Ethyl methacylate | µg/L | U.S. | | | ND |
| Hexachlorobutadiene | µg/L | U.S. | | | ND |
| 2-Hexanone | µg/L | U.S. | | | ND |
| Iodomethane | µg/L | U.S. | | | ND |
| Isopropylbenzene | µg/L | U.S. | | | ND |
| 4-Isopropyltoluene | µg/L | U.S. | | | ND |
| Linolool | µg/L | U.S. | | | ND |
| Methacrylonitrile | µg/L | U.S. | | | ND |
| Methylacrylate | µg/L | U.S. | | | ND |
| Methyl-t-butylether | µg/L | U.S. | 20 | EPA HA | ND |
| Methylene chloride | µg/L | U.S. | 5 | EPA | ND |
| Methylmethacrylate | µg/L | U.S. | | | ND |
| 4-Methyl-2-pentanone | µg/L | U.S. | | | ND |
| alpha-Methyl styrene | µg/L | U.S. | | | ND |
| Perfluoro-1,3-dimethylcyclohexane | µg/L | U.S. | | | ND |
| Tetrahydrofuran | µg/L | U.S. | | | ND |
| Toluene | µg/L | U.S. | | | <1.00 |
| m&p-Xylene | µg/L | U.S. | Total Xylenes 10000 | EPA | ND |
| o-Xylene | µg/L | U.S. | Total Xylenes 10000 | EPA | ND |
| **Extractable Organics** | | | | | |
| Acetophenone | µg/L | U.S. | | | ND |
| 2-Aminonaphthalene | µg/L | U.S. | | | ND |
| Aniline | µg/L | U.S. | | | ND |
| Azobenzene | µg/L | U.S. | | | ND |
| 2,2′-Azobis-isobutyronitrile | µg/L | U.S. | | | ND |
| Benzaldehyde | µg/L | U.S. | | | 4.9 |
| Benzoic acid | µg/L | U.S. | | | ND |
| Benzothiazole | µg/L | U.S. | | | ND |
| Benzyl alcohol | µg/L | U.S. | | | 43.5 |
| Benzyl butyl phthlate | µg/L | U.S. | 7000 | EPA DWEL | <4 |
| 2-Butoxyethanol | µg/L | U.S. | | | ND |
| 2-(2-Butoxyethoxy)ethanol | µg/L | U.S. | | | ND |
| 2-(2-Butoxyethoxy)ethyl acetate | µg/L | U.S. | | | ND |
| n-Butylpalmitate | µg/L | U.S. | | | ND |
| Butylated hydroxyanisole (BHA) | µg/L | U.S. | | | ND |
| N-Butylbenzenesulfonamide | µg/L | U.S. | | | <4 |
| 3-tert-Butylphenol | µg/L | U.S. | | | <12 |
| Caffeine | µg/L | U.S. | | | ND |

# TABLE 5. STORED WATER RESULTS

| Mission<br>Sample Location<br>Sample Description<br>Sample Date<br>Analysis/Sample ID | Units | Test Conducted by | Maximum Contaminant Level (MCL) | Maximum Contaminant Level Source | Mir 24<br>SVO-ZV<br>stored water<br>11/27/97<br>98-0202-06 |
|---|---|---|---|---|---|
| **Extractable Organics contd.** | | | | | |
| Caprolactam | µg/L | U.S. | | | 117.5 |
| tris-2-Chloroethyl phosphate | µg/L | U.S. | | | <4 |
| Cyclododecane | µg/L | U.S. | | | ND |
| Cyclohexanone | µg/L | U.S. | | | ND |
| Decamethylcyclopentasiloxane | µg/L | U.S. | | | ND |
| 1,4 Diacetylbenzene | µg/L | U.S. | | | ND |
| 1,3- Dichlorobenzene | µg/L | U.S. | 600 | EPA | ND |
| 1,4-Dichlorobenzene | µg/L | U.S. | 75 | EPA | ND |
| Di-n-butylamine | µg/L | U.S. | | | ND |
| Diallyl Phthalate | µg/L | U.S. | | | ND |
| Di-n-butyl phthalate | µg/L | U.S. | 4000 | EPA DWEL | <4 |
| N,N-Dibutylformamide | µg/L | U.S. | | | ND |
| 2,6-Di-t-butyl-1,4-benzoquinone | µg/L | U.S. | | | ND |
| 3,5-Di-t-butyl-4-hydroxybenzaldehyde | µg/L | U.S. | | | ND |
| 2,6-Di-t-butyl-4-methylphenol | µg/L | U.S. | | | ND |
| 2,4-Di-t-butylphenol | µg/L | U.S. | | | ND |
| Dicyclohexyl | µg/L | U.S. | | | ND |
| N,N-Diethylformamide | µg/L | U.S. | | | ND |
| N,N-Diethyl-m-toluamide | µg/L | U.S. | | | ND |
| Diethylene glycol di-n-butyl ether | µg/L | U.S. | | | ND |
| Diethylene glycol monoethyl ether | µg/L | U.S. | | | ND |
| Diethyl phthalate | µg/L | U.S. | 5000 | EPA HA | 6.6 |
| Diisopropyl Adipate | µg/L | U.S. | | | ND |
| N,N-Dimethylacetamide | µg/L | U.S. | | | ND |
| N,N-Dimethylbenzylamine | µg/L | U.S. | | | ND |
| Dimethylcarbamyl chloride | µg/L | U.S. | | | ND |
| N,N-Dimethylformamide | µg/L | U.S. | | | ND |
| Dimethyl phthalate | µg/L | U.S. | | | <4 |
| Dimethylthiocarbamoyl chloride | µg/L | U.S. | | | ND |
| Dipropylene glycol methyl ether | µg/L | U.S. | | | ND |
| Dodecamethylcyclohexasiloxane | µg/L | U.S. | | | ND |
| Dodecanoic acid | µg/L | U.S. | | | <120 |
| Eicosane | µg/L | U.S. | | | ND |
| 2-Ethoxyethanol | µg/L | U.S. | | | ND |
| 2-Ethylhexanoic acid | µg/L | U.S. | | | ND |
| 2-Ethyl-1-hexanol | µg/L | U.S. | | | 20.2 |
| bis-2-Ethylhexyl adipate | µg/L | U.S. | 400 | EPA | ND |
| bis-2-Ethylhexyl phthalate (Dioctyl phthlate) | µg/L | U.S. | 6 | EPA HA | ND |
| 4-Ethylmorpholine | µg/L | U.S. | | | ND |
| 4-Ethylphenol | µg/L | U.S. | | | ND |
| 1-Formylpiperidine | µg/L | U.S. | | | ND |
| Heneicosane | µg/L | U.S. | | | ND |
| 2-Heptanone | µg/L | U.S. | | | ND |
| Hexanoic acid | µg/L | U.S. | | | ND |
| 2-Hexanol | µg/L | U.S. | | | ND |
| Hexanamide | µg/L | U.S. | | | ND |
| Hydrocinnamic acid | µg/L | U.S. | | | <8 |
| 2-Hydroxybenzothiazole | µg/L | U.S. | | | ND |
| 4-Hydroxy-4-methyl-2-pentanone | µg/L | U.S. | | | ND |

# TABLE 5. STORED WATER RESULTS

| **Mission**<br>**Sample Location**<br>**Sample Description**<br>**Sample Date**<br>**Analysis/Sample ID** | **Units** | **Test Conducted by** | **Maximum Contaminant Level (MCL)** | **Maximum Contaminant Level Source** | **Mir 24**<br>SVO-ZV<br>stored water<br>11/27/97<br>**98-0202-06** |
|---|---|---|---|---|---|
| **Extractable Organics contd.** | | | | | |
| Indole | µg/L | U.S. | | | ND |
| Isophorone | µg/L | U.S. | 100 | EPA HA | ND |
| Isophorone | µg/L | U.S. | | | ND |
| Limonene | µg/L | U.S. | | | ND |
| Menthol | µg/L | U.S. | | | ND |
| Menthone | µg/L | U.S. | | | ND |
| 2-Mercaptobenzothiazole | µg/L | U.S. | | | ND |
| 2,2′-Methylenebis (6-t-butyl-4-ethylphenol) | µg/L | U.S. | | | ND |
| 3-Methyl-2-cyclohexen-1-one | µg/L | U.S. | | | ND |
| Methyl-4-hydroxybenzoate | µg/L | U.S. | | | ND |
| 3-Methylindole | µg/L | U.S. | | | ND |
| 2-Methyl-2,4-pentanediol | µg/L | U.S. | | | ND |
| 2-Methylphenol | µg/L | U.S. | | | <4 |
| 4-Methylphenol | µg/L | U.S. | | | ND |
| 2-Methylpyrazine | µg/L | U.S. | | | ND |
| 1-Methyl-2-pyrrolidinone | µg/L | U.S. | | | ND |
| Methyl sulfone | µg/L | U.S. | | | ND |
| 2-Methylthiobenzothiazole | µg/L | U.S. | | | ND |
| Monomethyl phthalate | µg/L | U.S. | | | ND |
| Neomenthol | µg/L | U.S. | | | ND |
| Nicotine | µg/L | U.S. | | | ND |
| Nonadecane | µg/L | U.S. | | | ND |
| Octadecanol | µg/L | U.S. | | | ND |
| Octamethylcyclotetrasiloxane | µg/L | U.S. | | | ND |
| Octanoic Acid | µg/L | U.S. | | | ND |
| 4-t-Octylphenol | µg/L | U.S. | | | ND |
| Oxindole | µg/L | U.S. | | | ND |
| Pentacosane | µg/L | U.S. | | | ND |
| s-Phenethyl alcohol | µg/L | U.S. | | | ND |
| Phenol | µg/L | U.S. | 1/4000 | NASA/EPA HA | 12.8 |
| bis-Phenol A | µg/L | U.S. | | | ND |
| Phenoxyacetic acid | µg/L | U.S. | | | ND |
| 2-Phenoxyethanol | µg/L | U.S. | | | ND |
| N-Phenyl-2-naphthylamine | µg/L | U.S. | | | ND |
| 2-Phenylacetic Acid | µg/L | U.S. | | | ND |
| Phenylethyl alcohol | µg/L | U.S. | | | ND |
| 2-Phenylphenol | µg/L | U.S. | | | ND |
| 2-Phenyl-2-propanol | µg/L | U.S. | | | <4 |
| Phenyl sulfone | µg/L | U.S. | | | ND |
| Phthalide | µg/L | U.S. | | | ND |
| Salicyclic Acid | µg/L | U.S. | | | ND |
| Squalene | µg/L | U.S. | | | ND |
| 1-alpha-Terpineol | µg/L | U.S. | | | ND |
| 1-Tetradecanol | µg/L | U.S. | | | ND |
| Tetramethylsuccinonitrile | µg/L | U.S. | | | <4 |
| Tetramethylthiourea | µg/L | U.S. | | | ND |
| Tetramethylurea | µg/L | U.S. | | | ND |
| Thymol | µg/L | U.S. | | | <4 |
| o-Toluic acid | µg/L | U.S. | | | ND |

# TABLE 5. STORED WATER RESULTS

| Mission<br>Sample Location<br>Sample Description<br>Sample Date<br>Analysis/Sample ID | Units | Test Conducted by | Maximum Contaminant Level (MCL) | Maximum Contaminant Level Source | Mir 24<br>SVO-ZV<br>stored water<br>11/27/97<br>98-0202-06 |
|---|---|---|---|---|---|
| **Extractable Organics contd.** | | | | | |
| 1,3,5-Triallyl-1,3,5-triazine-2,4,6(1H,3H,5H)-trione | µg/L | U.S. | | | ND |
| Tricosane | µg/L | U.S. | | | ND |
| Tributyl Phosphate | µg/L | U.S. | | | ND |
| Triethyl Phosphate | µg/L | U.S. | | | ND |
| Triethylamine | µg/L | U.S. | | | ND |
| 2,2,4-Trimethyl-1,3-pentanediol diisobutyrate | µg/L | U.S. | | | <8 |
| Undecanoic Acid | µg/L | U.S. | | | ND |
| 2-Undecanone | µg/L | U.S. | | | ND |
| Urethane | µg/L | U.S. | | | ND |
| Vanillin | µg/L | U.S. | | | ND |
| **Alcohols (DAI/GC/MS)** | | | | | |
| Ethanol | µg/L | U.S. | | | 6662 |
| Methanol | µg/L | U.S. | | | ND |
| 1-Methoxy-2-propanol | µg/L | U.S. | | | ND |
| 2-Methyl-2-butanol | µg/L | U.S. | | | ND |
| 2-Methyl-2-propanol | µg/L | U.S. | | | ND |
| 2-Propanol | µg/L | U.S. | | | ND |
| **Alcohols/Acetone** | | | | | |
| Acetone | µg/L | Russia | | | ND |
| Butanol | µg/L | Russia | | | NA |
| Ethanol | µg/L | Russia | | | ND |
| Isoamyl alcohol | µg/L | Russia | | | ND |
| Methanol | µg/L | Russia | | | ND |
| Propanol | µg/L | Russia | | | ND |
| **Glycols (DAI/GC/MS)** | | | | | |
| 1,2-Ethanediol | µg/L | U.S. | 7000 | EPA HA | ND |
| 1,2-Propanediol | µg/L | U.S. | | | ND |
| **Glycols** | | | | | |
| 1,2-Ethanediol | µg/L | Russia | 7000 | EPA HA | 1500 |
| 1,2-Propanediol | µg/L | Russia | | | NA |
| **Organic Acids (SPE/GC/MS)** | | | | | |
| Acetic acid | µg/L | U.S. | | | NA |
| Acetic acid | µg/L | Russia | | | 15400 |
| Lactic acid | µg/L | U.S. | | | NA |
| Propionic acid | µg/L | U.S. | | | NA |
| **Aldehydes** | | | | | |
| Acetaldehyde | µg/L | U.S. | | | NA |
| Formaldehyde | µg/L | U.S. | 1000 | EPA HA | <2 |
| **Carboxylates (CE)** | | | | | |
| Acetate | mg/L | U.S. | | | 0.19 |
| Butyrate | mg/L | U.S. | | | NA |
| Formate | mg/L | U.S. | | | 61.7 |
| Glycolate | mg/L | U.S. | | | <0.12 |
| Glyoxylate | mg/L | U.S. | | | <0.12 |
| Lactate | mg/L | U.S. | | | <0.12 |
| Propionate | mg/L | U.S. | | | <0.12 |
| Oxalate | mg/L | U.S. | | | <0.12 |

# TABLE 5. STORED WATER RESULTS

| **Mission**<br>**Sample Location**<br>**Sample Description**<br>**Sample Date**<br>**Analysis/Sample ID** | **Units** | **Test Conducted by** | **Maximum Contaminant Level (MCL)** | **Maximum Contaminant Level Source** | **Mir 24**<br>SVO-ZV<br>stored water<br>11/27/97<br>**98-0202-06** |
|---|---|---|---|---|---|
| **Amines (CE)** | | | | | |
| Ethylamine | mg/L | U.S. | | | <0.12 |
| Methylamine | mg/L | U.S. | | | <0.12 |
| Propylamine | mg/L | U.S. | | | <0.12 |
| Trimethylamine | mg/L | U.S. | | | <0.12 |
| **Urea** | mg/L | U.S. | | | ND |
| **Organic Carbon Recovery** | percent | U.S. | | | 100.07 |

ND = not detected
NA = not analyzed
DWEL = Drinking Water Equivalent Level
HA = Health Advisory

## TABLE 6. HUMIDITY CONDENSATE AND SURFACE CONDENSATE RESULTS

| **Mission** | | | **Mir 24** | **Mir 24** | **Mir 24** | **Mir 24** | **Mir 24** | **Mir 24** |
|---|---|---|---|---|---|---|---|---|
| **Sample Location** | | | CRS | CRS | CRS | CRS | CRS | CRS |
| **Sample Description** | | | condensate | condensate | condensate | filter reactor condensate | filter reactor condensate | surface condensate |
| **Sample Date** | | **Test Conducted** | 11/17/97 | 1/19/98 | 1/28/98 | 11/28-11/29/97 | 1/17-1/18/97 | 1/19/98 |
| **Analysis/Sample ID** | **Units** | **by** | **98-0202-07** | **98-0202-08** | **98-0202-09** | **98-0202-10** | **98-0202-16** | **98-0202-11** |
| **Conductivity** | µS/cm | U.S. | 370 | 280 | 330 | 200 | NA | 310 |
| **Conductivity** | µS/cm | Russia | NA | 260 | NA | 180 | NA | NA |
| **pH** | pH units | U.S. | 6.19 | 7.66 | 7.67 | 5.55 | NA | 7.63 |
| **pH** | pH units | Russia | NA | NA | NA | 6 | NA | NA |
| **Turbidity** | NTU | U.S. | NA | NA | NA | 7.5 | NA | NA |
| **Turbidity** | mg/L | Russia | NA | 0.12 | NA | 0.2 | NA | NA |
| **Color True** | degrees | Russia | NA | NA | NA | 10 | NA | NA |
| **Odor at 20°C** | grade | Russia | 1 | 1 | NA | 2 | NA | NA |
| **Taste at 20°C** | grade | Russia | NA | NA | NA | NA | NA | NA |
| **Total Solids** | mg/L | Russia | NA | NA | NA | NA | NA | NA |
| **Total Hardness** | meq/L | Russia | NA | NA | NA | 1.9 | NA | NA |
| **Chemical Oxygen Demand** | mg $O_2$/L | Russia | 155 | 700 | NA | 55 | NA | NA |
| **Anions (CE/IC)** | | | | | | | | |
| Bromide | mg/L | U.S. | <0.50 | <0.50 | <0.50 | <0.05 | NA | 0.52 |
| Chloride | mg/L | U.S. | 5.43 | <0.15 | <0.15 | 0.44 | NA | 3.07 |
| Fluoride | mg/L | U.S. | 0.20 | <0.10 | <0.10 | <0.10 | NA | 0.14 |
| Nitrate as Nitrogen (NO3-N) | mg/L | U.S. | <0.08 | <0.11 | 0.22 | <0.11 | NA | < 0.11 |
| Nitrite as Nitrogen (NO2-N) | mg/L | U.S. | 0.27 | <0.08 | <0.08 | <0.08 | NA | < 0.08 |
| Phosphate as P (PO4-P) | mg/L | U.S. | <0.24 | 0.25 | <0.24 | <0.24 | NA | <0.24 |
| Sulfate | mg/L | U.S. | 4.60 | <0.75 | 7.10 | <0.75 | NA | 2.10 |
| **Cations (CE/IC)** | | | | | | | | |
| Ammonia as Nitrogen (NH3-N) | mg/L | U.S. | 34.1 | 34.3 | 31.2 | 24.8 | NA | 35.4 |
| Calcium | mg/L | U.S. | 0.728 | 0.06 | 6.11 | <0.002 | NA | 0.775 |
| Lithium | mg/L | U.S. | <0.002 | <0.002 | <0.002 | <0.002 | NA | <0.002 |
| Magnesium | mg/L | U.S. | 6.57 | 0.397 | 1.39 | 0.149 | NA | 0.861 |
| Potassium | mg/L | U.S. | 0.651 | <0.002 | 0.225 | <0.002 | NA | 2.26 |
| Sodium | mg/L | U.S. | 7.77 | 0.619 | 1.54 | 0.328 | NA | 2.09 |
| **Minerals** | | | | | | | | |
| Ammonium (NH4) | mg/L | Russia | NA | 61 | NA | 42 | NA | NA |
| Calcium | mg/L | Russia | NA | NA | NA | NA | NA | NA |
| Magnesium | mg/L | Russia | NA | NA | NA | NA | NA | NA |
| **Metals** | | | | | | | | |
| Calcium | µg/L | U.S. | NA | NA | NA | NA | NA | NA |
| Magnesium | µg/L | U.S. | NA | NA | NA | NA | NA | NA |

## TABLE 6. HUMIDITY CONDENSATE AND SURFACE CONDENSATE RESULTS

| Mission | | | Mir 24 | Mir 24 | Mir 24 | Mir 24 | Mir 24 | Mir 24 |
|---|---|---|---|---|---|---|---|---|
| Sample Location | | | CRS | CRS | CRS | CRS | CRS | CRS |
| Sample Description | | | condensate | condensate | condensate | filter reactor condensate | filter reactor condensate | surface condensate |
| Sample Date | | Test Conducted | 11/17/97 | 1/19/98 | 1/28/98 | 11/28-11/29/97 | 1/17-1/18/97 | 1/19/98 |
| Analysis/Sample ID | Units | by | 98-0202-07 | 98-0202-08 | 98-0202-09 | 98-0202-10 | 98-0202-16 | 98-0202-11 |
| **Metals contd.** | | | | | | | | |
| Sodium | µg/L | U.S. | NA | NA | NA | NA | NA | NA |
| Potassium | µg/L | U.S. | NA | NA | NA | NA | NA | NA |
| Silver | µg/L | U.S. | <20 | <20 | <20 | 53.7 | NA | <20 |
| Silver ion | µg/L | Russia | 0 | 0 | NA | 0 | NA | NA |
| Aluminum | µg/L | U.S. | 90.1 | 61.8 | <20 | 7.4 | NA | 667 |
| Arsenic | µg/L | U.S. | <10 | <10 | <10 | <1 | NA | <10 |
| Barium | µg/L | U.S. | 34.4 | 23.0 | 43.2 | 1.2 | NA | 19.8 |
| Cadmium | µg/L | U.S. | 30.3 | 14.2 | <10 | <1 | NA | 157.0 |
| Chromium | µg/L | U.S. | <50 | <50 | 77.4 | <5 | NA | <50 |
| Cobalt | µg/L | U.S. | <10 | <10 | <10 | <1 | NA | <10 |
| Copper | µg/L | U.S. | <10 | 21.6 | 30.0 | 1.6 | NA | 35.8 |
| Iron | µg/L | U.S. | 70.9 | 60.2 | 160 | <5 | NA | 2180 |
| Mercury | µg/L | U.S. | <2.5 | <2.5 | 4.53 | <0.5 | NA | <2.5 |
| Manganese | µg/L | U.S. | 86.7 | <10 | 15.5 | 1.0 | NA | 86.5 |
| Molybdenum | µg/L | U.S. | 11.6 | <10 | 20.6 | 2.5 | NA | 135 |
| Nickel | µg/L | U.S. | 95.9 | 135 | 52.3 | 4010 | NA | 38.8 |
| Lead | µg/L | U.S. | 26.8 | 29.4 | <10 | 21.3 | NA | <10 |
| Selenium | µg/L | U.S. | <10 | <10 | <10 | <1 | NA | <10 |
| Zinc | µg/L | U.S. | 2760 | 954 | 1540 | 157 | NA | 120 |
| Palladium | µg/L | U.S. | NA | NA | NA | NA | NA | NA |
| Silicon | µg/L | U.S. | NA | NA | NA | NA | NA | NA |
| Tungsten | µg/L | U.S. | NA | NA | NA | NA | NA | NA |
| **Total Organic Carbon** | | | | | | | | |
| TIC (OI 1010) | mg/L | U.S. | NA | NA | NA | NA | NA | NA |
| POC (OI 1010) | mg/L | U.S. | NA | NA | NA | NA | NA | NA |
| NPOC (OI 1010) | mg/L | U.S. | NA | NA | NA | NA | NA | NA |
| TOC (OI 1010) | mg/L | U.S. | NA | NA | NA | NA | NA | NA |
| TIC (Sievers 800) | mg/L | U.S. | 44.4 | 33.0 | 35.4 | 23.7 | NA | 36.0 |
| TOC (Sievers 800) | mg/L | U.S. | 50.5 | 184.0 | 192 | 10 | NA | 136 |
| **Total Organic Carbon** | | | | | | | | |
| TOC (Sievers 800) | mg/L | Russia | 49 | 64.8 | NA | 11.1 | NA | NA |

## TABLE 6. HUMIDITY CONDENSATE AND SURFACE CONDENSATE RESULTS

| **Mission** | | | **Mir 24** | **Mir 24** | **Mir 24** | **Mir 24** | **Mir 24** | **Mir 24** |
|---|---|---|---|---|---|---|---|---|
| **Sample Location** | | | CRS | CRS | CRS | CRS | CRS | CRS |
| **Sample Description** | | | condensate | condensate | condensate | filter reactor condensate | filter reactor condensate | surface condensate |
| **Sample Date** | | **Test Conducted** | 11/17/97 | 1/19/98 | 1/28/98 | 11/28-11/29/97 | 1/17-1/18/97 | 1/19/98 |
| **Analysis/Sample ID** | **Units** | **by** | **98-0202-07** | **98-0202-08** | **98-0202-09** | **98-0202-10** | **98-0202-16** | **98-0202-11** |
| **Volatile Organics** | | | | | | | | |
| Acetaldehyde | µg/L | U.S. | NA | NA | NA | NA | NA | NA |
| Acetone | µg/L | U.S. | ND | 199.61 | 88.31 | 56.31 | NA | 174.30 |
| Acryloniltrile | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Allyl chloride | ND | U.S. | ND | ND | ND | ND | NA | ND |
| Benzene | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Bromobenzene | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Bromochloromethane | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Bromodichloromethane | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Bromoform | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Bromomethane | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| 2-Butanone | µg/L | U.S. | ND | 26.44 | 15.16 | ND | NA | ND |
| n-Butylbenzene | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| s-Butylbenzene | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| t-Butylbenzene | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Carbon disulfide | µg/L | U.S. | 544.63 | 1339.1 | 2750.9 | 13.49 | NA | ND |
| Carbon tetrachloride | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Chloroacetonitrile | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Chlorobenzene | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| 1-Chlorobutane | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Chloroethane | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Chloroform | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Chloromethane | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| 2-Chlorotoluene | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| 4-Chlorotoluene | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Dibromochloromethane | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| 1,2-Dibromo-3-chloropropane | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| 1,2-Dibromoethane | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Dibromomethane | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| 1,2-Dichlorobenzene | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| 1,3-Dichlorobenzene | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| 1,4-Dichlorobenzene | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| trans-1,4-dichloro-2-butene | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Dichlorodifluoromethane | µg/L | U.S. | ND | ND | ND | ND | NA | ND |

## TABLE 6. HUMIDITY CONDENSATE AND SURFACE CONDENSATE RESULTS

| **Mission** | | | **Mir 24** | **Mir 24** | **Mir 24** | **Mir 24** | **Mir 24** | **Mir 24** |
|---|---|---|---|---|---|---|---|---|
| **Sample Location** | | | CRS | CRS | CRS | CRS | CRS | CRS |
| **Sample Description** | | | condensate | condensate | condensate | filter reactor condensate | filter reactor condensate | surface condensate |
| **Sample Date** | | **Test Conducted** | 11/17/97 | 1/19/98 | 1/28/98 | 11/28-11/29/97 | 1/17-1/18/97 | 1/19/98 |
| **Analysis/Sample ID** | **Units** | **by** | **98-0202-07** | **98-0202-08** | **98-0202-09** | **98-0202-10** | **98-0202-16** | **98-0202-11** |
| **Volatile Organics contd.** | | | | | | | | |
| 1,1-Dichloroethane | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| 1,2-Dichloroethane | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| 1,1-Dichloroethene | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| cis1,2-dichloroethene | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| trans-1,2-dichloroethene | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| 1,2-Dichloropropane | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| 1,3-Dichloropropane | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| 2,2-Dichloropropane | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| 1,2-Dichloropropene | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| cis-1,3-Dichloropropene | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| trans-1,3-Dichloropropene | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Diethyl ether | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Ethylbenzene | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Ethyl methacylate | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Hexachlorobutadiene | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Hexachloroethane | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| 2-Hexanone | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Iodomethane | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Isopropylbenzene | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| 4-Isopropyltoluene | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Linolool | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Methacrylonitrile | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Methylacrylate | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Methyl-t-butylether | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Methylene chloride | µg/L | U.S. | 3.69 | ND | ND | 1.56 | NA | 4.43 |
| Methylmethacrylate | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| 4-Methyl-2-pentanone | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| alpha-Methyl styrene | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Pentachloroethane | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Perfluoro-1,3-dimethylcyclohexane | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Tetrahydrofuran | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Toluene | µg/L | U.S. | ND | ND | <2.00 | <1.00 | NA | ND |
| Trichloroethene | µg/L | U.S. | ND | ND | ND | ND | NA | ND |

## TABLE 6. HUMIDITY CONDENSATE AND SURFACE CONDENSATE RESULTS

| Mission | | | Mir 24 | Mir 24 | Mir 24 | Mir 24 | Mir 24 | Mir 24 |
|---|---|---|---|---|---|---|---|---|
| Sample Location | | | CRS | CRS | CRS | CRS | CRS | CRS |
| Sample Description | | | condensate | condensate | condensate | filter reactor condensate | filter reactor condensate | surface condensate |
| Sample Date | | Test Conducted | 11/17/97 | 1/19/98 | 1/28/98 | 11/28-11/29/97 | 1/17-1/18/97 | 1/19/98 |
| Analysis/Sample ID | Units | by | 98-0202-07 | 98-0202-08 | 98-0202-09 | 98-0202-10 | 98-0202-16 | 98-0202-11 |
| **Volatile Organics contd.** | | | | | | | | |
| m&p-Xylene | µg/L | U.S. | ND | ND | ND | <2.00 | NA | ND |
| o-Xylene | µg/L | U.S. | ND | ND | ND | <1.00 | NA | <2.00 |
| **Extractable Organics** | | | | | | | | |
| Acetophenone | µg/L | U.S. | ND | 35.2 | ND | <8 | NA | ND |
| 2-Aminonaphthalene | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Aniline | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Azobenzene | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| 2,2′-Azobis-isobutyronitrile | µg/L | U.S. | 41.6 | 41.5 | 36.4 | <24 | NA | 52.0 |
| Benzaldehyde | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Benzoic acid | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Benzothiazole | µg/L | U.S. | 128.3 | 90.7 | 73.3 | 11 | NA | 34.9 |
| Benzyl alcohol | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Benzyl butyl phthlate | µg/L | U.S. | ND | ND | ND | <4 | NA | ND |
| 2-Butoxyethanol | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| 2-(2-Butoxyethoxy)ethanol | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| 2-(2-Butoxyethoxy)ethyl acetate | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| n-Butylpalmitate | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Butylated hydroxyanisole (BHA) | µg/L | U.S. | ND | ND | ND | <4 | NA | ND |
| N-Butylbenzenesulfonamide | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| 3-tert-Butylphenol | µg/L | U.S. | 246.1 | 340.5 | 279 | <12 | NA | 402.4 |
| Caffeine | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Caprolactam | µg/L | U.S. | 942.4 | 17996.7 | 2921.5 | ND | NA | ND |
| tris-2-Chloroethyl phosphate | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| o-Cresol (2-Methylphenol) | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Cyclododecane | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Cyclohexanone | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Decamethylcyclopentasiloxane | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| 1,4 Diacetylbenzene | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| 1,3-Dichlorobenzene | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| 1,4-Dichlorobenzene | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Di-n-butylamine | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Diallyl Phthalate | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Di-n-butyl phthalate | µg/L | U.S. | ND | 21.1 | ND | <4 | NA | ND |

# TABLE 6. HUMIDITY CONDENSATE AND SURFACE CONDENSATE RESULTS

| Mission | | | Mir 24 | Mir 24 | Mir 24 | Mir 24 | Mir 24 | Mir 24 |
|---|---|---|---|---|---|---|---|---|
| Sample Location | | | CRS | CRS | CRS | CRS | CRS | CRS |
| Sample Description | | | condensate | condensate | condensate | filter reactor condensate | filter reactor condensate | surface condensate |
| Sample Date | | Test Conducted | 11/17/97 | 1/19/98 | 1/28/98 | 11/28-11/29/97 | 1/17-1/18/97 | 1/19/98 |
| Analysis/Sample ID | Units | by | 98-0202-07 | 98-0202-08 | 98-0202-09 | 98-0202-10 | 98-0202-16 | 98-0202-11 |
| **Extractable Organics contd.** | | | | | | | | |
| N,N-Dibutylformamide | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| 2,6-Di-t-butyl-1,4-benzoquinone | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| 3,5-Di-t-butyl-4-hydroxybenzaldehyde | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| 2,6-Di-t-butyl-4-methylphenol | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| 2,4-Di-t-butylphenol | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Dicyclohexyl | µg/L | U.S. | 4.9 | 8.8 | ND | <4 | NA | 11.8 |
| N,N-Diethylformamide | µg/L | U.S. | 107.3 | 219.6 | ND | <12 | NA | 81.2 |
| N,N-Diethyl-m-toluamide | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Diethylene glycol di-n-butyl ether | µg/L | U.S. | 7.9 | <4 | ND | ND | NA | 9.9 |
| Diethylene glycol monoethyl ether | µg/L | U.S. | 90.6 | 167.3 | ND | 9.3 | NA | 44.9 |
| Diethyl phthalate | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Diisopropyl Adipate | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| N,N-Dimethylacetamide | µg/L | U.S. | ND | 4203.1 | 3293.2 | ND | NA | 497.9 |
| N,N-Dimethylbenzylamine | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Dimethylcarbamyl chloride | µg/L | U.S. | 103 | 163.5 | ND | ND | NA | ND |
| N,N-Dimethylformamide | µg/L | U.S. | ND | 4222.5 | ND | ND | NA | ND |
| Dimethyl phthalate | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Dimethylthiocarbamoyl chloride | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Dipropylene glycol methyl ether | µg/L | U.S. | ND | 73.0 | ND | <4 | NA | ND |
| Dodecamethylcyclohexasiloxane | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Dodecanoic acid | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Eicosane | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| 2-Ethoxyethanol | µg/L | U.S. | ND | 2428.4 | ND | ND | NA | ND |
| 2-Ethylhexanoic acid | µg/L | U.S. | 88.1 | 142.9 | ND | ND | NA | ND |
| 2-Ethyl-1-hexanol | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| bis-2-Ethylhexyl adipate | µg/L | U.S. | ND | ND | 18674 | <4 | NA | ND |
| bis-2-Ethylhexyl phthalate (Dioctyl phthlate) | µg/L | U.S. | ND | 52.5 | ND | 4.7 | NA | 76.8 |
| 4-Ethylmorpholine | µg/L | U.S. | 79.6 | 81.7 | 278.2 | ND | NA | ND |
| 4-Ethylphenol | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| 1-Formylpiperidine | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Heneicosane | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| 2-Heptanone | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Hexanoic acid | µg/L | U.S. | ND | ND | ND | ND | NA | ND |

## TABLE 6. HUMIDITY CONDENSATE AND SURFACE CONDENSATE RESULTS

| **Mission** | | | **Mir 24** | **Mir 24** | **Mir 24** | **Mir 24** | **Mir 24** | **Mir 24** |
|---|---|---|---|---|---|---|---|---|
| **Sample Location** | | | CRS | CRS | CRS | CRS | CRS | CRS |
| **Sample Description** | | | condensate | condensate | condensate | filter reactor condensate | filter reactor condensate | surface condensate |
| **Sample Date** | | **Test Conducted** | 11/17/97 | 1/19/98 | 1/28/98 | 11/28-11/29/97 | 1/17-1/18/97 | 1/19/98 |
| **Analysis/Sample ID** | **Units** | **by** | **98-0202-07** | **98-0202-08** | **98-0202-09** | **98-0202-10** | **98-0202-16** | **98-0202-11** |
| **Extractable Organics contd.** | | | | | | | | |
| 2-Hexanol | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Hexanamide | µg/L | U.S. | 80.9 | 105.0 | ND | <4 | NA | 67.0 |
| Hydrocinnamic acid | µg/L | U.S. | ND | ND | ND | ND | NA | 103.7 |
| 4-Hydroxy-4-methyl-2-pentanone | µg/L | U.S. | ND | 159.9 | 878.5 | <4 | NA | ND |
| 2-Hydroxybenzothiazole | µg/L | U.S. | 48.6 | 126.5 | ND | <4 | NA | ND |
| Indole | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Isophorone | µg/L | U.S. | ND | ND | ND | <4 | NA | ND |
| Isophorone | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Limonene | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| p-Menth-1-en-8-ol (alpha-Terpineol) | µg/L | U.S. | ND | ND | ND | <4 | NA | ND |
| Menthol | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Menthone | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| 2-Mercaptobenzothiazole | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| 2,2′-Methylenebis (6-t-butyl-4-ethylphenol) | µg/L | U.S. | ND | ND | ND | 105.1 | NA | ND |
| 3-Methyl-2-cyclohexen-1-one | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Methyl-4-hydroxybenzoate | µg/L | U.S. | ND | ND | ND | <4 | NA | ND |
| 3-Methylindole | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| 2-Methyl-2,4-pentanediol | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| 4-Methylphenol | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| 2-Methylpyrazine | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| 1-Methyl-2-pyrrolidinone | µg/L | U.S. | 311.4 | 675.7 | 276.4 | 4 | NA | ND |
| Methyl sulfone | µg/L | U.S. | 39.3 | 195.1 | 100 | 11.6 | NA | 44.4 |
| 2-Methylthiobenzothiazole | µg/L | U.S. | 15.2 | 95.6 | 82.7 | 26.3 | NA | ND |
| Monomethyl phthalate | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Neomenthol | µg/L | U.S. | ND | ND | ND | <4 | NA | ND |
| Nicotine | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Nonadecane | µg/L | U.S. | ND | ND | ND | <4 | NA | ND |
| Octadecanol | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Octamethylcyclotetrasiloxane | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Octanoic Acid | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| 4-t-Octylphenol | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Oxindole | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Pentacosane | µg/L | U.S. | ND | ND | ND | ND | NA | ND |

## TABLE 6. HUMIDITY CONDENSATE AND SURFACE CONDENSATE RESULTS

| **Mission** | | | **Mir 24** | **Mir 24** | **Mir 24** | **Mir 24** | **Mir 24** | **Mir 24** |
|---|---|---|---|---|---|---|---|---|
| **Sample Location** | | | CRS | CRS | CRS | CRS | CRS | CRS |
| **Sample Description** | | | condensate | condensate | condensate | filter reactor condensate | filter reactor condensate | surface condensate |
| **Sample Date** | | **Test Conducted** | 11/17/97 | 1/19/98 | 1/28/98 | 11/28-11/29/97 | 1/17-1/18/97 | 1/19/98 |
| **Analysis/Sample ID** | **Units** | **by** | **98-0202-07** | **98-0202-08** | **98-0202-09** | **98-0202-10** | **98-0202-16** | **98-0202-11** |
| **Extractable Organics contd.** | | | | | | | | |
| s-Phenethyl alcohol | µg/L | U.S. | ND | 8.6 | ND | ND | NA | ND |
| Phenol | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| bis-Phenol A | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Phenoxyacetic acid | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| 2-Phenoxyethanol | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| N-Phenyl-2-naphthylamine | µg/L | U.S. | ND | ND | ND | 5.7 | NA | ND |
| 2-Phenylacetic Acid | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Phenylethyl alcohol | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| 2-Phenylphenol | µg/L | U.S. | ND | ND | ND | <4 | NA | ND |
| 2-Phenyl-2-propanol | µg/L | U.S. | 185.3 | 183 | 154.7 | <4 | NA | 158.5 |
| Phenyl sulfone | µg/L | U.S. | ND | 19.0 | ND | <4 | NA | ND |
| Phthalide | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Salicyclic Acid | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Squalene | µg/L | U.S. | ND | ND | ND | <8 | NA | ND |
| 1-Tetradecanol | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Tetramethylsuccinonitrile | µg/L | U.S. | 44.9 | 44.9 | 39.4 | 6.6 | NA | 56.1 |
| Tetramethylthiourea | µg/L | U.S. | 553.6 | 472.9 | 925.9 | 14.8 | NA | 30.9 |
| Tetramethylurea | µg/L | U.S. | 225.9 | 370.4 | 388.5 | 6.3 | NA | 139.8 |
| Thymol | µg/L | U.S. | 125.4 | 159.0 | 151 | <4 | NA | 194.0 |
| o-Toluic acid | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| 1,3,5-Triallyl-1,3,5-triazine-2,4,6(1H,3H,5H)-trione | µg/L | U.S. | ND | ND | ND | <4 | NA | ND |
| Tricosane | µg/L | U.S. | ND | ND | ND | <4 | NA | ND |
| Tributyl Phosphate | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Triethyl Phosphate | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Triethylamine | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| 2,2,4-Trimethyl-1,3-pentanediol diisobutyrate | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Undecanoic Acid | µg/L | U.S. | ND | ND | ND | <24 | NA | ND |
| 2-Undecanone | µg/L | U.S. | ND | ND | ND | <4 | NA | ND |
| Urethane | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Vanillin | µg/L | U.S. | ND | ND | ND | ND | NA | ND |

## TABLE 6. HUMIDITY CONDENSATE AND SURFACE CONDENSATE RESULTS

| **Mission** | | | **Mir 24** | **Mir 24** | **Mir 24** | **Mir 24** | **Mir 24** | **Mir 24** |
|---|---|---|---|---|---|---|---|---|
| **Sample Location** | | | CRS | CRS | CRS | CRS | CRS | CRS |
| **Sample Description** | | | condensate | condensate | condensate | filter reactor condensate | filter reactor condensate | surface condensate |
| **Sample Date** | | **Test Conducted** | 11/17/97 | 1/19/98 | 1/28/98 | 11/28-11/29/97 | 1/17-1/18/97 | 1/19/98 |
| **Analysis/Sample ID** | **Units** | **by** | **98-0202-07** | **98-0202-08** | **98-0202-09** | **98-0202-10** | **98-0202-16** | **98-0202-11** |
| **Alcohols (DAI/GC/MS)** | | | | | | | | |
| 1-Butanol | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Ethanol | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| Methanol | µg/L | U.S. | ND | 1565 | 470 | ND | NA | ND |
| 1-Methoxy-2-propanol | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| 2-Methyl-2-butanol | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| 2-Methyl-2-propanol | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| 1-Propanol | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| 2-Propanol | µg/L | U.S. | ND | ND | ND | ND | NA | ND |
| **Alcohols/Acetone** | | | | | | | | |
| Acetone | µg/L | Russia | ND | ND | NA | ND | NA | NA |
| Butanol | µg/L | Russia | ND | ND | NA | ND | NA | NA |
| Ethanol | µg/L | Russia | ND | ND | NA | ND | NA | NA |
| Isoamyl alcohol | µg/L | Russia | ND | ND | NA | ND | NA | NA |
| Methanol | µg/L | Russia | ND | 1500 | NA | ND | NA | NA |
| Propanol | µg/L | Russia | ND | ND | NA | ND | NA | NA |
| **Glycols (DAI/GC/MS)** | | | | | | | | |
| 1,2-Ethanediol | µg/L | U.S. | ND | 342500 | 270000 | ND | ND | ND |
| 1,2-Propanediol | µg/L | U.S. | ND | 18200 | 14000 | ND | ND | ND |
| **Glycols** | | | | | | | | |
| 1,2-Ethanediol | µg/L | Russia | ND | 35100 | NA | 1000 | NA | NA |
| 1,2-Propanediol | µg/L | Russia | NA | NA | NA | NA | NA | NA |
| **Organic Acids (SPE/GC/MS)** | | | | | | | | |
| Acetic acid | µg/L | U.S. | NA | NA | NA | NA | NA | NA |
| Acetic acid | µg/L | Russia | 24500 | 33500 | NA | 7500 | NA | NA |
| Lactic acid | µg/L | U.S. | NA | NA | NA | NA | NA | NA |
| Propionic acid | µg/L | U.S. | NA | NA | NA | NA | NA | NA |
| **Aldehydes** | | | | | | | | |
| Acetaldehyde | µg/L | U.S. | NA | NA | NA | NA | NA | NA |
| Formaldehyde | µg/L | U.S. | 24.8 | 40.7 | 41.8 | 5.1 | NA | 16.2 |
| **Carboxylates (CE)** | | | | | | | | |
| Acetate | mg/L | U.S. | <2.5 | <0.12 | <1.25 | <0.12 | NA | <2.5 |
| Butyrate | mg/L | U.S. | NA | NA | NA | NA | NA | NA |
| Formate | mg/L | U.S. | <0.12 | 0.44 | <1.25 | <0.12 | NA | <2.5 |

## TABLE 6. HUMIDITY CONDENSATE AND SURFACE CONDENSATE RESULTS

| **Mission** | | | **Mir 24** | **Mir 24** | **Mir 24** | **Mir 24** | **Mir 24** | **Mir 24** |
|---|---|---|---|---|---|---|---|---|
| **Sample Location** | | | CRS | CRS | CRS | CRS | CRS | CRS |
| **Sample Description** | | | condensate | condensate | condensate | filter reactor condensate | filter reactor condensate | surface condensate |
| **Sample Date** | | **Test Conducted** | 11/17/97 | 1/19/98 | 1/28/98 | 11/28-11/29/97 | 1/17-1/18/97 | 1/19/98 |
| **Analysis/Sample ID** | **Units** | **by** | **98-0202-07** | **98-0202-08** | **98-0202-09** | **98-0202-10** | **98-0202-16** | **98-0202-11** |
| **Carboxylates (CE) contd.** | | | | | | | | |
| Glycolate | mg/L | U.S. | <0.12 | 4.95 | 2.43 | <0.12 | NA | <2.5 |
| Glyoxylate | mg/L | U.S. | <0.12 | <0.12 | <1.25 | <0.12 | NA | <2.5 |
| Lactate | mg/L | U.S. | <2.5 | 0.71 | 3.11 | 0.21 | NA | <2.5 |
| Propionate | mg/L | U.S. | <2.5 | 4.71 | 4.20 | <1.25 | NA | <2.5 |
| Oxalate | mg/L | U.S. | <0.12 | <0.12 | <1.25 | <0.12 | NA | <2.5 |
| **Amines (CE)** | | | | | | | | |
| Ethylamine | mg/L | U.S. | <0.12 | <0.12 | <0.12 | <0.12 | NA | <0.12 |
| Methylamine | mg/L | U.S. | 0.53 | <0.12 | 0.12 | <0.12 | NA | <0.12 |
| Propylamine | mg/L | U.S. | <0.12 | <0.12 | <0.12 | <0.12 | NA | <0.12 |
| Trimethylamine | mg/L | U.S. | <0.12 | <0.12 | <0.12 | <0.12 | NA | <0.12 |
| **Urea** | mg/L | U.S. | 6.19 | ND | 2.18 | ND | NA | ND |
| **Organic Carbon Recovery** | percent | U.S. | 7.20 | 90.17 | 70.81 | 3.14 | NA | 1.06 |

ND = not detected
NA = not analyzed

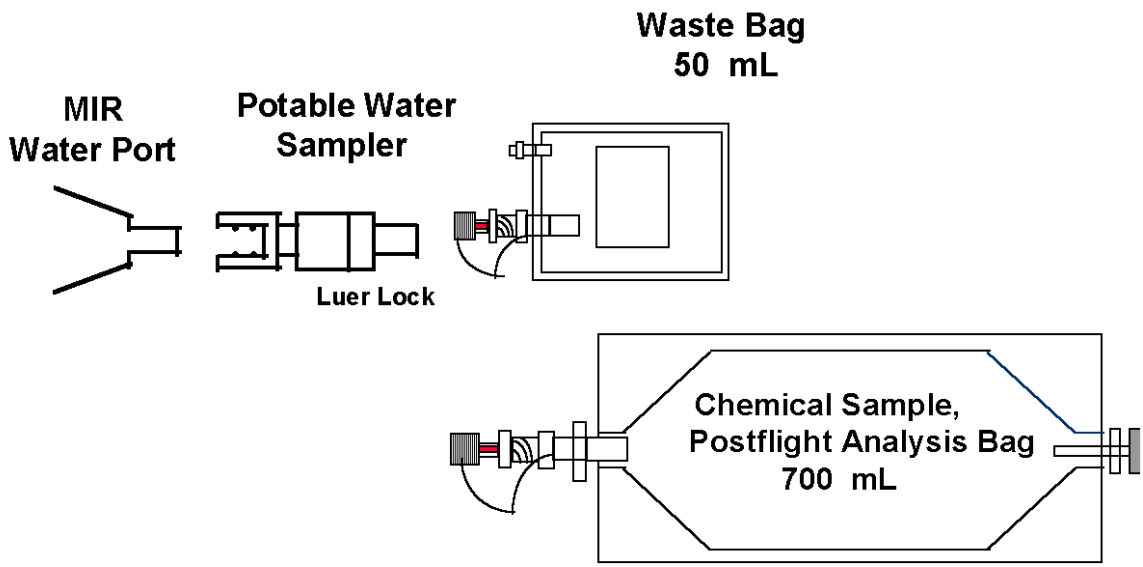


**Figure 1.** Sample Collection Methodology