NEW MEXICO ENVIRONMENT DEPARTMENT

***Surface Water Quality Bureau***

# Sacramento Mountains
# 2014

***Amended***

# FIELD SAMPLING PLAN

Prepared by
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Approvals

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This document is intended to serve as a companion to the 2012 Sacramento Mountains field sampling plan (FSP). It was written to document planned sampling and field work for the 2014 field season, made necessary by data gaps that resulted from the wild fires and flooding that occurred in 2012. Background information on the survey area, sampling locations and sampling frequency can be seen in the 2012 FSP.

The tables that appear below show the samples necessary to complete the survey that was planned in 2012. Because of requirements made by the Surface Water Quality Bureau's Assessment Protocol (AP), the majority of samples required to complete the sampling planned in 2012 are nutrient and chlorophyll *a* samples, and sonde deployments. Even though most of these samples were collected as planned in 2012, the AP stipulates that causal variables (nutrients) and response variables (pH, dissolved oxygen, as measured by deployed sondes, and chlorophyll *a*) for nutrient assessment must be measured during the same field season. Therefore, unless a complete data set was obtained during 2012, a new, complete set of nutrient data must be collected in 2014.

Apart from the samples necessary to complete nutrient assessments, the majority of the remainder of the work outlined in this amendment is to complete sampling and habitat monitoring that was precluded by the Little Bear Fire and subsequent flooding in the Rio Bonito and Eagle Creek watersheds. Data from these samples will be used to track recovery of this watershed through both natural and anthropogenic processes.

**Table 1.** Chemical sampling planned in 2014.

| Station Number | Station Name | Assessment Unit (AU) | AU ID | WQS | TDS/TSS | Nutrients[1] | Dissolved Metals[2] | Total Metals[3] | E. coli | SVOC[4] | VOC[5] | Radionuclides[6] | Station Rationale |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Rio Bonito abv Bonito Lake @ FR 107 | Rio Bonito (NM 48 near Angus to headwaters) | NM-2209.A_10 | 20.6.4.209 | 4 | 4 | 0 | 0 | 4 | 0 | 0 | 0 | Only station in AU |
| 2 | Bonito Lake | Bonito Lake | NM-2209.B_10 | 20.6.4.209* | 4 | 4 | 0 | 0 | 4 | 0 | 0 | 0 | Monitor Lake |
| 3 | Rio Bonito at Angus Bridge | Rio Bonito (NM 48 near Angus to headwaters | NM-2209.A_10 | 20.6.4.98* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Lowest station in AU |
| 4 | Rio Bonito @ BLM Apple Orchard Site | Rio Bonito (Rio Ruidoso to NM 48 near Angus) | NM-2208_10 | 20.6.4.208 | 4 | 4 | 0 | 0 | 4 | 0 | 0 | 2 | Reference site; only perennial reach |
| 5 | South Fork Eagle Creek @ USGS gage | S. Fork Eagle Creek (Eagle Creek to Mescalero Apache bnd) | NM-2209.A_00 | 20.6.4.98* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Only station in AU |
| 6 | Alto Lake | Alto Lake | NM-2209.B_30 | 20.6.4.98** | 4 | 4 | 0 | 0 | 4 | 0 | 0 | 0 | Monitor Lake |
| 7 | Eagle Creek below Alto Lake | Eagle Creek (Rio Ruidoso to Alto Lake)) | NM-98.A_007 | 20.6.4.98* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Only station in AU |
| 8 | Rio Ruidoso @ Mescalero boundary @ gage | Rio Ruidoso (US Hwy 70 Bridge to Mescalero Apache bnd) | NM-2209.A_20 | 20.6.4.209 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | Monitor above village |

| Station Number | Station Name | Assessment Unit (AU) | AU ID | WQS | TDS / TSS | Nutrients[1] | Dissolved Metals[2] | Total Metals[3] | E. coli | SVOC[4] | VOC[5] | Radionuclides[6] | Station Rationale |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9 | Rio Ruidoso above Carrizo Creek @ Two Rivers Park | Rio Ruidoso (US Hwy 70 Bridge to Mescalero Apache bnd) | NM-2209.A_20 | 20.6.4.209 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | Monitor below upper village |
| 10 | Rio Ruidoso below Ruidoso Downs Racetrack Property | Rio Ruidoso (US Hwy 70 Bridge to Mescalero Apache bnd) | NM-2209.A_20 | 20.6.4.209 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | Monitor impacts of racetrack |
| 11 | Rio Ruidoso above Hwy 70 bridge | Rio Ruidoso (US Hwy 70 Bridge to Mescalero Apache bnd) | NM-2209.A_20 | 20.6.4.209 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | Bottom of AU |
| 12 | Ruidoso New WWTP Outfall | Rio Ruidoso (Rio Bonito to US Hwy 70 Bridge) | NM-2208_20 | NPDES Permit NM0029165 and 20.6.4.208 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Determine contribution from WWTP |
| 13 | Rio Ruidoso at CR E002 | Rio Ruidoso (Rio Bonito to US Hwy 70 Bridge) | NM-2208_20 | 20.6.2.208 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Monitor stream below input from WWTP |
| 14 | Rio Ruidoso @ Glencoe-FR 443 | Rio Ruidoso (Rio Bonito to US Hwy 70 Bridge) | NM-2208_20 | 20.6.4.208 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Down-stream end of perennial each |
| 15/16* | Rio Hondo 100 yds below confluence<br><br>Rio Hondo @ Riverside | Rio Hondo (perennial reaches Bonney Canyon to Rio Ruidoso) | NM-2208_30 | 20.6.4.208 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | Lowest accessible site on AU; NMWQS refinement |

| Station Number | Station Name | Assessment Unit (AU) | AU ID | WQS | TDS / TSS | Nutrients[1] | Dissolved Metals[2] | Total Metals[3] | E. coli | SVOC[4] | VOC[5] | Radionuclides[6] | Station Rationale |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17 | Carrizo Creek @ Mescalero Boundary | Carrizo Creek (Rio Ruidoso to Mescalero Apache bnd) | NM-2209.A_22 | 20.6.4.209 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Monitor water leaving Tribal lands |
| 18 | Carrizo Creek @ Two Rivers Park | Carrizo Creek (Rio Ruidoso to Mescalero Apache bnd) | NM-2209.A_22 | 20.6.4.209 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Bottom of AU |
| 19 | Grindstone Creek above Grindstone Reservoir | Grindstone Canyon abv Grindstone Reservoir | NM-98.A_009 | 20.6.4.98* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | No previous data |
| 20 | Grindstone Canyon Reservoir | Grindstone Canyon Reservoir | NM-2209.B_20 | 20.6.4.208* | 4 | 4 | 0 | 0 | 4 | 0 | 0 | 0 | Monitor Reservoir |
| 21 | Grindstone Creek below Grindstone Reservoir | Grindstone Canyon blw Grindstone Reservoir | NM-98.A_008 | 20.6.4.98* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Monitor receiving water for NPDES permit |
| 22 | Rio Peñasco @ Bluff Springs | Rio Peñasco (HWY 24 to headwaters) | NM-2208_00 | 20.6.4.208 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Monitor upper perennial reach |
| 23 | Rio Peñasco on USFS (below Mayhill) | Rio Peñasco (HWY 24 to headwaters) | NM-2208_00 | 20.6.4.208 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Below Mayhill; deter-mine flow status |
| 24 | Rio Peñasco @ Hwy 24 Bridge | Rio Peñasco (HWY 24 to headwaters) | NM-2208_00 | 20.6.4.208 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | Bottom of AU |
| 25 | Rio Penasco near Helena Road | Rio Peñasco (Pecos River to Hwy 24) | NM-2206.A_10 | 20.6.4.206* | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | Only station in AU |

| Station Number | Station Name | Assessment Unit (AU) | AU ID | WQS | TDS / TSS | Nutrients[1] | Dissolved Metals[2] | Total Metals[3] | E. coli | SVOC[4] | VOC[5] | Radionuclides[6] | Station Rationale |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 26 | Agua Chiquita between Weed and Sacramento | Agua Chiquita (perennial portions Rio Peñasco to headwaters) | NM-2208_01 | 20.6.4.208 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Only station in perennial reach |
| 27 | Agua Chiquita near mouth on Rio Peñasco | Agua Chiquita (perennial portions Rio Peñasco to headwaters) | NM-2208_01 | 20.6.4.206* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Bottom of AU |
| 28 | Sacramento River @ USGS Gage | Sacramento River (Perennial reaches) | NM-2805_00 | 20.6.4.208 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Only station in perennial reach |
| 29 | Sacramento River below Timberon | Sacramento River (Perennial reaches) | NM-2805_00 | 20.6.4.98* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Bottom of AU |
| 30 | 3 Rivers @ USFS Camp-ground | Three Rivers (USFS bnd to headwaters) | NM-2802_01 | 20.6.4.802 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | Only station in perennial reach |
| 31 | Nogal Creek @ CR B-17 | Nogal Creek (Tularosa Creek to Mescalero Apache bnd) | NM-2801_10 | 20.6.4.801 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Only station in AU |
| 32 | Tularosa Creek @ USGS Gage 08481500 | Tularosa Creek (Old US 70 crossing to Mescalero Apache bnd) | NM-2801_01 | 20.6.4.801 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | Only station in AU |

| Station Number | Station Name | Assessment Unit (AU) | AU ID | WQS | TDS / TSS | Nutrients[1] | Dissolved Metals[2] | Total Metals[3] | E. coli | SVOC[4] | VOC[5] | Radionuclides[6] | Station Rationale |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 33 | La Luz Creek @ CR A-70 | La Luz Creek (perennial portions) | NM-2801_40 | 20.6.4.801 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | Only station in AU |
| 34 | Cloudcroft WWTP effluent | Fresnal Canyon (La Luz Creek to headwaters) | NM-2801_41 | NPDES Permit NM0023370 and 20.6.4.801 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Monitor effluent |
| 35 | Karr Canyon above Raven Road | Karr Canyon (Fresnal Canyon to headwaters) | NM-2801_42 | 20.6.4.801 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Only station in AU |
| 36 | Rio Salado above Fresnal Canyon | Salado Canyon (Fresnal Canyon to headwaters) | NM-2801_43 | 20.6.4.801 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | Only station in AU |
| 37 | Fresnal Creek @ Alamogordo Water intake | Fresnal Canyon (La Luz Creek to headwaters) | NM-2801_41 | 20.6.4.801 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Only station in AU |
| 38 | San Andreas Canyon | San Andreas Canyon (perennial portions) | NM-2801_30 | 20.6.4.99 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Only station in AU |
| 39 | Dog Canyon @ nature trail | Dog Canyon Creek (perennial portions) | NM-2801_20 | 20.6.4.801 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Only station in AU |
| Quality Control Samples | | | | | 0 | 5 | 0 | 0 | 5 | 0 | 0 | 0 | |

| Station Number | Station Name | Assessment Unit (AU) | AU ID | WQS | TDS / TSS | Nutrients[1] | Dissolved Metals[2] | Total Metals[3] | E. coli | SVOC[4] | VOC[5] | Radionuclides[6] | Station Rationale |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Totals | | | | | 20 | 42 | 0 | 0 | 42 | 0 | 0 | 2 | |

*Samples will be collected at either station 15 or 16 depending on status of flow and access.
[1] Suite includes total Kjeldahl nitrogen (TKN), nitrate+nitrite, ammonia and total phosphorus. [2] Suite includes aluminum ,antimony, arsenic, barium, boron, cadmium, calcium, chromium, cobalt, copper, iron, magnesium, manganese, molybdenum, nickel, silicon, silver, tin, vanadium, zinc and hardness. [3] Aluminum, selenium and mercury only. [4] Semi-volatile organic compounds. See Appendix B for a list of analytes included in this suite [5] Volatile organic compounds. See Appendix IB for a list of analytes included in this suite. [6] A radionuclide sample will initially be analyzed for gross alpha and gross beta radiation and, depending on results of the gross alpha and gross beta screen, may include uranium mass and radium 226 + 228.

**Table 2.** Nutrient, biological and habitat sampling summary.

| Station Number | Station Name | Assessment Unit (AU) | Ecoregion | Sedimentation[1] Habitat[2] | Thermograph | Sonde[3] | Nutrient Survey[4] | Chlorophyll | Phytoplankton | Macroinvertebrates | Hydrology Protocol |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Rio Bonito above Bonito Lake @ FR 107 | Rio Bonito (NM 48 near Angus to headwaters) | 23f | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 |
| 2 | Bonito Reservoir | Rio Bonito (NM 48 near Angus to headwaters) | 23f | 0 | 0 | 0 | 0 | 4 | 4 | 0 | 0 |
| 3 | Rio Bonito@ Angus Bridge | Rio Bonito (NM 48 near Angus to headwaters | 23c | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 4 | Rio Bonito @ BLM Apple Orchard Site | Rio Bonito (Rio Ruidoso to NM 48 near Angus) | 23b | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| 5 | South Fork Eagle Creek @ USGS gage | S. Fork Eagle Creek (Eagle Creek to Mescalero Apache bnd) | 23c | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 6 | Alto Lake | Alto Lake | 23c | 0 | 0 | 0 | 0 | 4 | 4 | 0 | 0 |

| Station Number | Station Name | Assessment Unit (AU) | Ecoregion | Sedimentation Habitat[1][2] | Thermograph | Sonde[3] | Nutrient Survey[4] | Chlorophyll | Phytoplankton | Macroinvertebrates | Hydrology Protocol |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 7 | South Fork Eagle Creek below Alto Lake | S. Fork Eagle Creek (Eagle Creek to Mescalero Apache bnd) | 23c | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 9 | Rio Ruidoso above Carrizo Creek @ Two Rivers Park | Rio Ruidoso (US Hwy 70 Bridge to Mescalero Apache bnd) | 23f | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 |
| 11 | Rio Ruidoso above Hwy 70 bridge | Rio Ruidoso (US Hwy 70 Bridge to Mescalero Apache bnd) | 23b | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 0 |
| 13 | Rio Ruidoso at CR E002 | Rio Ruidoso (Rio Bonito to US Hwy 70 Bridge) | 23b | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 14 | Rio Ruidoso @ Glencoe-FR 443 | Rio Ruidoso (Rio Bonito to US Hwy 70 Bridge) | 23b | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 15/16* | Rio Hondo @ Riverside/100 yds below confluence | Rio Hondo (perennial reaches Bonney Canyon to Rio Ruidoso) | 26q | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 |
| 18 | Carrizo Creek @ Two Rivers Park | Carrizo Creek (Rio Ruidoso to Mescalero Apache bnd) | 23f | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 |
| 19 | Grindstone Creek above Grindstone Reservoir | Grindstone Canyon abv Grindstone Reservoir | 23b | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20 | Grindstone Reservoir | Grindstone Canyon Reservoir | 23b | 0 | 0 | 0 | 0 | 4 | 4 | 0 | 0 |
| 21 | Grindstone Creek below Grindstone Reservoir | Grindstone Canyon blw Grindstone Reservoir | 23b | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 22 | Rio Peñasco @ Bluff Springs | Rio Peñasco (HWY 24 to headwaters) | 23c | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| Station Number | Station Name | Assessment Unit (AU) | Ecoregion | Sedimentation Habitat[1][2] | Thermograph | Sonde[3] | Nutrient Survey[4] | Chlorophyll | Phytoplankton | Macroinvertebrates | Hydrology Protocol |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 23 | Rio Peñasco on USFS (below Mayhill) | Rio Peñasco (HWY 24 to headwaters) | 26o | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 24 | Rio Peñasco at Hwy 24 Bridge | Rio Peñasco (HWY 24 to headwaters) | 23b | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 |
| 25 | Rio Penasco near Helena Road | Rio Peñasco (Pecos River to Hwy 24) | 24a | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 |
| 27 | Aqua Chiquita near mouth on Rio Peñasco | Agua Chiquita (perennial portions Rio Peñasco to headwaters) | 23c | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 28 | Sacramento River @ USGS Gage | Sacramento River (Perennial reaches) | 23f | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 29 | Sacramento River blw Timberon | Sacramento River (Perennial reaches) | 23f | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 30 | Three Rivers @ USFS Campground | Three Rivers (USFS bnd to headwaters) | 23b | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 31 | Nogal Creek @ CR B-17 | Nogal Creek (Tularosa Creek to Mescalero Apache bnd) | 23b | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 32 | Tularosa Creek @ USGS Gage 08481500 | Tularosa Creek (Old US 70 crossing to Mescalero Apache bnd) | 23a | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 |
| 33 | La Luz Creek @ CR A-70 | La Luz Creek (perennial portions) | 23b | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 |
| 35 | Karr Canyon above Raven Road | Karr Canyon (Fresnal Canyon to headwaters) | 23f | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| Station Number | Station Name | Assessment Unit (AU) | Ecoregion | Sedimentation[1] Habitat[2] | Thermograph | Sonde[3] | Nutrient Survey[4] | Chlorophyll | Phytoplankton | Macroinvertebrates | Hydrology Protocol |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 36 | Rio Salado above Fresnal Canyon | Salado Canyon (Fresnal Canyon to headwaters) | 23a | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 |
| 37 | Fresnal Creek @ Alamogordo Water intake | Fresnal Canyon (La Luz Creek to headwaters) | 23a | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 38 | San Andreas Canyon | San Andres Canyon (perennial portions) | 23a | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 39 | Dog Canyon @ nature trail | Dog Canyon Creek (perennial portions) | 23a | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Quality Control Samples | | | 2 | 2 | 0 | 0 | 3 | 1 | 1 | 2 |
| Totals | | | | 6 | 9 | 12 | 12 | 25 | 13 | 6 | 10 |

*Samples will be collected at either station 15 or 16 depending on status of flow and access.
[1]If sedimentation data (pebble counts) exceed the threshold value for percent fines at a site, more extensive habitat data are collected during a subsequent visit. [2]Habitat data collection is triggered by sedimentation data (pebble counts) that show excessive values of percent fines as determined by exceedences of threshold values established for mountain, plains and foothills regions. [3] Sondes are deployed to collect turbidity data and as part of level 2 nutrient surveys. [4] Nutrient screening is a two-step process. A preliminary visual assessment of periphyton (level 1 screening) is used to determine if level 2 sampling, consisting of periphyton collection, chlorophyll determinations, water samples for nitrogen and phosphorus, and a sonde deployment to record diurnal variations in pH and dissolved oxygen concentrations, is warranted.

Estimated analytical charges for the planned samples are shown in Table 3. Transportation costs (Table 4) assume a gas price of $3.00 per gallon and vehicle mileage of 15 miles per gallon. Per Diem costs estimates appear in Table 5 and total estimated resources for the amended sampling plan are listed in Table 6.

**Table 3.** Estimated analytical charges.

| Analyte / Analysis | Number of Samples | Cost per Sample | Totals |
|---|---|---|---|
| TDS/TSS | 20 | 24 | 480 |
| Nutrients | 47 | 76 | 3,572 |
| Dissolved Metals | 0 | 207 | 0 |
| Total Metals | 6 | 100 | 600 |
| Volatile Organic Compounds (VOCs) | 0 | 150 | 0 |
| Semi-Volatiles (SVOCs) | 0 | 220 | 0 |
| Radionuclides | 2 | 120 | 440 |
| **Total (WTUs)** | | | **5,092** |
| E. *coli* (SWQB) | 47 | $5.08 | $239 |
| Benthic Macroinvertebrates | 6 | $175 | $1,050 |
| Chlorophyll *a* (SWQB) | 25 | $45 | $1,125 |
| Phytoplankton | 13 | $165 | $2,145 |
| **Total (USD)** | | | **$4,559** |

**Table 4.** Transportation costs.

| Type of Work | Approximate miles per trip | Number of Trips | Fuel Costs |
|---|---|---|---|
| Water Chemistry Sampling – Streams | 750 | 4 | $600 |
| Water Chemistry Sampling – Lakes | 500 | 4 | $400 |
| Nutrient/Habitat/ Surveys + Hydrology Protocol | 750 | 6 | $900 |
| **Total** | | | **$ 1,900** |

**Table 5**. Per diem and staff time estimates.

| | Chemical Sampling | Biological / Habitat Sampling + Hydrology Protocol | Total | Cost |
|---|---|---|---|---|
| Per Diem (number of nights) | 8 | 12 | 20 | $1,700[1] |
| Staff Days | 16 | 24 | 40[2] | 40 |

[1]Per Diem estimates do not include partial days and are based on $85/night. [2]Time for preparation, loading and unloading vehicles, maintenance and cleaning of equipment is not included

**Table 6**. Estimated total required resources.

| WTUs | Analyses | Fuel | Per Diem | Staff Days |
|---|---|---|---|---|
| 5,092 | $ 4,559 | $ 1,900 | $ 1,700 | 40 |