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*Working together for healthy watersheds on the Kenai Peninsula*

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April 1, 2024

Katherine Brown  
Tribal Trust and Assistance Branch  
Regional Administrator's Division (TTAB-122)  
1200 6th Avenue, Suite 155  
Seattle, WA 98101

Email: [brown.katherine@epa.gov](mailto:brown.katherine@epa.gov)

Dear Ms. Brown,

Kenai Watershed Forum coordinates the efforts of a cooperative water quality monitoring program focused on the Kenai River in south central Alaska. We are providing this technical memo to inform the EPA Region 10 office of several minor revisions to the project's current Quality Assurance Project Plan (QAPP version 3.0). The changes include the following items:

- Updating personnel names on the distribution list and technical advisory committee
- Including use of new models of hand-held water probes to collect intrinsic water quality parameter observations:
  - YSI ProQuatro (pH, temperature, conductivity, dissolved oxygen)
  - Hach 2100P (turbidity)
- Describing where, when, and how opportunistic observations of the five parameters listed above may be collected, using the new hand-held probes. ("Opportunistic," to mean occurring on dates outside of solely the two standard spring & summer dates currently described in the QAPP)

No changes to data quality objectives or sample locations are included in this technical memo.

We have documented these proposed changes within this technical memo and will publish it as an addendum to the full QAPP document posted on [www.kenaiwatershed.org](http://www.kenaiwatershed.org). When a future opportunity occurs to conduct a formal revision of the QAPP, we will incorporate these changes in to the proposed document edits.

Thank you for your time and assistance. Sincerely,

A handwritten signature in black ink, appearing to read 'Ben Meyer'.

Benjamin Meyer  
Kenai Watershed Forum, Environmental Scientist  
[ben@kenaiwatershed.org](mailto:ben@kenaiwatershed.org)  
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**April 2024**

**Revisions to “Kenai River Water Quality Monitoring Quality Assurance Project Plan (QAPP), Multi-Agency Baseline, v3,” available at the web address in the footnote<sup>1</sup>.**

**1.) Updating personnel names on the distribution list and technical advisory committee (arrow indicates change)**

- Page 7, “A4. Distribution List”
  - Mitch Michaud → Trent Dodson
  - Moses Jordan → Alana Shaw ([alana.shaw@kenaitze.org](mailto:alana.shaw@kenaitze.org))
  - Yvonne Weber → Vacant
  - Amber Bethe → Amber Crawford ([amber.crawford@alaska.gov](mailto:amber.crawford@alaska.gov))
- Page 8, “KWF Director”
  - Mitch Michaud → Trent Dodson
- Page 46, “Appendix A: Technical Advisory Committee”
  - Sara Apsens
    - → Change in job title & agency
    - → Habitat Branch – Fish and Wildlife Biologist, Kenai Fish and Wildlife Conservation Office, 43655 Kalifornsky Beach Road, Soldotna, AK 99669
  - Jack Blackwell
    - → Retired, remove from list

**2.) Use of new models of hand-held water probes to collect intrinsic water quality parameter observations (pH, temperature, conductivity, dissolved oxygen, and turbidity)**

Kenai Watershed Forum will include use of two new portable field instruments, 1.) the hand held probe YSI ProQuatro, and 2) the Hach 2100P portable turbidimeter. They will be used at existing sites year-round as resources and site conditions permit.

- Page 13, “Schedule”
  - Add additional bullet point:
  - “Opportunistic data collection of intrinsic water quality parameters will occur at established sites throughout the year, including pH, turbidity, water temperature, specific conductivity, and dissolved oxygen.”

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<sup>1</sup> <https://www.kenaiwatershed.org/news-media/qapp-revisions-completed-2023/>

- Page 16, “Table 2. Data Quality Objectives for Electronic Instruments”
  - See the revised version of table 2 below for updated information in implementing the new instruments, a) YSI ProQuatro for pH, conductivity, dissolved oxygen, and temperature, and 2.) The Hach 2100P for turbidity

**Table 2. Data Quality Objectives for Electronic Instruments<sup>2,3</sup>**

PARAMETER	EPA METHOD	RANGE	UNITS	SENSITIVITY	PRECISION <sup>4</sup>	ACCURACY
pH	4500-H+ B-2000, pH probe on YSI ProQuatro	0 – 14	Standard pH units	0.01	0.01 units	± 0.2 units
Turbidity	2130 B ~ Nephelometric Method, Hach 2100Pportable turbidimeter	0 – 1000 NTU	Nephelometric Turbidity Units (NTU)	0.01	0.01 NTU or 1% of reading, whichever is greater	± 2%
Water Temperature	2550 B-2000, temperature probe on YSI models ProQuatro, 30, 55, and 95	-10°C – 60°C	Degrees Celsius (°C)	0.1, 0.1, 0.2, and 0.1	0.1°C	± 0.2°C
Conductance	120.1, conductivity probe on YSI ProQuatro	0 – 1000 uS/cm	Micro-siemens/cm (uS/cm) (converted to 25 C)	4 digits	No stated accuracy spec	± 0.5% of reading or 0.001 mS/uS. w.i.g.
Dissolved Oxygen	ASTM D888—09 (C), dissolved oxygen probe on YSI ProQuatro	0 to 20 mg/L	Milligrams per liter (mg/L)	0.1 mg/L	0.1% air saturation	0 to 20 mg/L: ± 2% of reading or 0.2 mg/L, w.i.g.  20 to 50 mg/L: ± 6% of reading (0.01 mg/L)

<sup>2</sup> <https://www.ysi.com/File%20Library/Documents/News%20Briefs/NB13-0116-01-EPA-Approved-Methods.pdf>
<sup>3</sup> <https://www.manualslib.com/manual/1279581/Hach-2100p.html>
<sup>4</sup> Instrument’s value in user manual for “resolution”



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- Page 33, “Table 10, Field Quality Control Samples”
  - Field Replicate Measurement (4<sup>th</sup> row)
    - Add content to the “Measurement Parameter” box:
      - “YSI ProQuatro (pH, DO, Specific Conductance, temperature), Hach 2100P (turbidity)”
    - Replace content of “Frequency of Occurrence” box:
      - “For hydrolabs, 2/each deployment (beginning and end) and at least 10% sample data collected. For YSI ProQuatro, 2/each per site visit within five minutes of each other.”
  - Calibration Verification Checks (6<sup>th</sup> row)
    - Add “or YSI ProQuatro” next to “Hydrolab”
    - Replace content of “Measurement Parameter” box:
      - Hydrolab (pH, Turbidity, Specific Conductance, DO), YSI ProQuatro (pH, Specific Conductance, DO), and Hach 2100P (Turbidity)
- Page 35, “Table 10, Field Quality Control Samples”
  - External QC check standard, turbidity (2<sup>nd</sup> to last row)
    - Frequency of occurrence box:
      - Minimum every 3 months (Hach 2008)
- Page 36, “B7. Instrument Calibration Procedures”
  - Add new sentence at end of 3<sup>rd</sup> paragraph:
    - “Standard calibration procedures for the YSI ProQuatro are outlined in the YSI “ProQuatro User Manual” # 606962-01 (YSI 2020), and for the Hach 2100P in “Portable Turbidimeter Model 2100P Instrument and Procedure Manual (# 46500-88) (Hach 2008). Both manuals are available to download as PDF documents in links in the bibliography.”
  - Replace paragraph beginning with, “Note: YSI meters...”
    - “Note: YSI meters are calibrated to the manual specifications for each model listed. YSI ProQuatro meters are used to measure pH, dissolved oxygen, specific conductance, and temperature. Any other models of YSI meter are used for water temperature only. The YSI meter QA form is found in Appendix I”
- Page 74, add Appendix M
  - Portable field meter calibration records form
- Page 75, add Appendix N
  - Portable field meter observation records form



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### **3.) Opportunistic observations of intrinsic water quality parameters, using the new hand-held instruments**

- In version 3 of the QAPP, five water quality parameters are collected using hand-held instruments at all twenty-two field sites twice annually, once in spring and once in summer, simultaneously when grab samples are collected.
- To characterize baseline conditions more thoroughly at these established sites, we will use portable field instruments to gather data at additional dates throughout the year as labor resources allow.
- We will use the **YSI ProQuatro** to measure in-situ conditions for pH, temperature, conductivity, and dissolved oxygen
  - All measurements for these parameters will be recorded in-situ on the field form provided in this technical memo (Appendix N).
- We will use the **Hach 2100P** portable turbidimeter to measure turbidity.
  - Measurements will be recorded preferably on-site, and data recorded on the field form provided in this technical memo (Appendix N).
  - When it is not possible to use the turbidimeter in-situ, samples will be collected and transported to the Kenai Watershed Forum office using methods identical to those described for total suspended solids (TSS) (Appendix B of QAPP)
  - After transport, prior to transferring samples to the 20 mL glass vials used for the Hach 2100P photometer, samples in the 1L HDPE bottles will be re-homogenized according to methods described for preparing Hach turbidity standards (Hach 2008) (each collection bottle will receive a series of gentle inversions).
- All individuals using the portable field instruments described above will receive a standardized training from the project manager or project quality assurance officer (page 8).

### **References**

Hach Company. 2008. Hach Portable Turbidimeter Model 2100P Instrument and Procedure Manual, 8th edition. <https://paperpile.com/app/p/2dd08e85-52b7-0733-8f74-e0128f7a72b1>

YSI Company. 2020. ProQuatro User Manual. Xylem. <https://www.ysi.com/File%20Library/Documents/Manuals/606962-ProQuatro-User-Manual-English.pdf>

For use with YSI Pro hand held probes and Hach 2100P portable turbidimeter, as specified in EPA technical memo April 2, 2024 for Kenai Watershed Forum  
QAPP v3

For use with YSI Pro hand held probes and Hach 2100P portable turbidimeter, as specified in EPA technical memo  
April 2, 2024 for Kenai Watershed Forum QAPP v3