

# **Continuous Records Processing Implementation Plan**

**Prepared by the Continuous Records Processing Implementation  
Committee  
May, 2008**

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# Contents

<b>Introduction</b>	<b>3</b>
<b>Definition and Guiding Principles</b>	<b>3</b>
<b>Timeline for Implementation</b>	<b>4</b>
<b>Metrics for Continuous Records Processing</b>	<b>4</b>
<b>Recommended Practices for Continuous Records Processing</b>	<b>5</b>
<b>Prioritizing and Scheduling</b>	<b>5</b>
<b>Field Operations</b>	<b>6</b>
<b>Office Operations</b>	<b>6</b>
<b>Management Practices</b>	<b>7</b>
<b>Utilizing Tools and Aids</b>	<b>8</b>
<b>Additional Capabilities and Tools needed for Continuous Records Processing</b>	<b>8</b>
<b>Automated Records Computation and Data Entry</b>	<b>8</b>
<b>Database Integration</b>	<b>9</b>
<b>Documentation - New Procedures and Tools for the Station Analysis</b>	<b>9</b>
<b>Policy and Guidance Memoranda</b>	<b>10</b>
<b>Training</b>	<b>10</b>
<b>Recommendation for Oversight Group for Needed Future Tools, Enhancements, and Capabilities</b>	<b>10</b>
<b>Existing References and Guidance available for Continuous Records Processing</b>	<b>11</b>
<b>Appendix A. A Proposed Approach for evaluating the effect of CRP on Historical and Real-time Data Quality</b>	<b>12</b>
<b>Appendix B. A Proposed Interim Process for Tracking Revisions to Hydrologic Data in NWISWeb and the Annual Water Data Report</b>	<b>14</b>
<b>Background</b>	<b>14</b>
<b>Definitions</b>	<b>14</b>
<b>Revision Elements in the Site Information Management System</b>	<b>15</b>
<b>Publishing Revisions in Annual Water Data Reports</b>	<b>16</b>
<b>Publishing Revisions in NWISWeb</b>	<b>16</b>
<b>References</b>	<b>17</b>
<b>Appendix C. Station Analysis Wizard Requirements</b>	<b>18</b>
<b>Station Analysis Basics</b>	<b>18</b>
<b>Stations Analysis Types</b>	<b>18</b>
<b>Station Analysis Elements</b>	<b>18</b>
<b>Station Analysis Wizard Requirements</b>	<b>21</b>
<b>Stations Analysis Retrieval Requirements</b>	<b>24</b>
<b>Annotated outline of example <i>period</i> ordered report</b>	<b>24</b>
<b>Annotated outline of example <i>element</i> ordered report</b>	<b>27</b>
<b>Testing a Station Analysis Wizard with Example Use Cases</b>	<b>29</b>
<b>Additional functions for a Station Analysis Wizard</b>	<b>29</b>

# Continuous Records Processing Implementation Plan

## Introduction

Because of increasing availability and use of USGS streamgaging and other time-series hydrologic data in real-time decision making processes, users have requested that data be approved or published much sooner after collection than has been USGS policy in the past. The WRD Senior Staff has tasked the Continuous Records Processing Implementation committee to develop an implementation plan that can be used across WRD to facilitate this earlier approval of time-series hydrologic data.

## Definition and Guiding Principles

What is Continuous Records Processing (CRP)? **Continuous records processing is the collection, analysis, review, and approval of time-series hydrologic data on a continuous (sub-water year) basis. At any given time, the time-series data will be as close to approval as computational methods and hydrologic interpretation will allow.**

There are two basic guiding principles implicit in this definition. The first is that CRP is **DATA DRIVEN**. This means that streamflow, groundwater levels, water-quality, or other time-series data are not approved until the analyst and reviewers are satisfied that the data are ready for approval and distribution without caveat. The approval criteria will depend on the individual site and its climatic and hydraulic characteristics, the stability of those characteristics, and the field protocols being used at that site. At the same time, data need to be reviewed and approved as soon as possible after all the necessary information becomes available. Resources must be allocated and prioritized to facilitate this review and approval.

The second guiding principle is that CRP cannot degrade the accuracy of the hydrologic information published by the USGS. High standards of accuracy and precision must be maintained in all data collection and analysis procedures. The USGS must provide the best data to the public as soon as possible. The committee recommends that a study be developed to monitor the effects of CRP on data accuracy. A proposal for such a study is included in Appendix A.

CRP requires a change in mindset by Water Science Centers (WSCs). Many WSCs currently work all their hydrologic records continuously, but do not then follow through with continuous checks, reviews, and approvals. Instead, most wait until a “records working season,” typically at the beginning of the next water year, to complete these tasks. For CRP to truly work, (1) the check, review, and approval steps need to be a high priority for the WSC (including management, data section, and studies section), (2) the steps need to be concurrent with the initial working process, and the steps need to be carefully tracked by WSC, Regional, and Headquarters management.

## Timeline for Implementation

The committee recommends that all Water Science Centers begin implementing the suggested CRP Recommended Practices and guidelines by **January 1, 2010**. Experience in Central Region WSCs has indicated that at least one year was needed to fully implement CRP. Not all desired tools and capabilities will be in place by that time, but the Water Resources Discipline thinks that CRP can be successfully implemented with the tools available now. Future development and enhancements will aid the process and need to be aggressively pursued and supported.

## Metrics for Continuous Records Processing

The Water Resources Discipline recommends that Continuous Records Processing be deemed successfully implemented when approved records are available on NWISWeb within 60 days of the date of collection of *all* material needed for proper analysis of that data. However, acknowledging that legitimate factors may prevent the approval of time-series data within 60 days, the Water Resources Discipline recommends the use of categories with varying time scales for approving records on a continuous basis. Science Centers should categorize their data-collection sites accordingly into one of the following three categories:

### Category 1 sites:

Category 1 sites are those where the majority of the time the data needed to compute records is in hand at the end of each site visit. Multiple site visits are not normally required in order to analyze a period of record. Data external to the site (supplied data, weather records, observer readings, etc.) are readily available. The continuous records process for these sites starts as soon as the hydrographer returns to the office from the site visit. Assuming up to a 60 day period between site visits and up to 60 days for records processing, then records for category 1 sites should be approved within 120 days of the date of collection. Thirty extra days are allotted after the second site visit for formal data approval or to allow for rework if necessary. Thus the metric for this category is that data be approved and **finalized in NWIS within 150 days**. To allow for temporary special conditions, only 80 percent of category 1 sites shall be expected to conform to this metric at any given time.

### Category 2 sites:

Category 2 sites are those where the data are typically processed on a seasonal basis. This could be because multiple site visits are generally required prior to data analysis, because site visits are infrequent, or because needed external data are not readily available. Although seasons can vary widely, it is assumed that no "season" lasts for more than 6 months. Again allowing 60 days to process records to approval, this would mean data for category 2 sites should normally be approved and **finalized in NWIS within 240 days** of collection. The extra 30 days should not be needed for these sites. Similar to category 1 sites, to allow for temporary special conditions, only 80 percent of category 2 sites shall be expected to conform to this metric at any given time.

### **Category 3 sites:**

Category 3 sites are special cases where continuous records processing does not currently apply. These should be fairly rare and each case may be unique. One example may be a new site where records cannot be finalized until a year or more of measurements are made to define an initial rating, upon which time the site would be moved to one of the other categories. Another example may be a complex project station or network of stations that has unique characteristics that preclude easy and timely analysis. **No date criteria are applied** to the data processing for these sites, as each is unique.

Ultimately, regardless of category, all data need to be approved, finalized, and published as part of the Annual Water Data Report by April 1 of the year following the water year of collection.

## **Recommended Practices for Continuous Records Processing**

There are no differences between the technical procedures used to compute records on a continuous basis and the traditional annual records process. Established USGS standards and procedures for computing records are followed; only the timing and frequency for when the records are computed and approved change. Traditionally, records were processed each year in their entirety for publication in the Annual Water Data Report. With CRP, the steps for processing station records begin immediately following each site visit. Records are worked, checked, reviewed, and approved as soon as the data will allow. More time will be needed to implement and maintain CRP because it will take more time to process the record several times a year, compared to once a year. WRD plans to develop tools to help reduce the amount of work required to process records through use of CRP.

### ***Prioritizing and Scheduling***

For CRP to be successful, all phases of the data collection and analysis process must be a priority for the WSC. To ensure the success of CRP, the Data Section should maintain a comprehensive work plan (extending 6 to 12 months in the future) that is shared with (and acknowledged by) everyone in the WSC. In addition to routine field work, time should be scheduled to include all phases of CRP, which includes working, checking, and reviewing the record. Implementation of CRP may require staffing changes. When possible, non-CRP activities such as planned field-maintenance trips, project work, training, meetings, and annual leave should be scheduled in advance to ensure adequate staff is available to maintain the continuity of the analysis process. When personnel from the Data Section are needed in support of other activities (such as projects), it is important that the Data Chief and/or Unit Chief be notified as soon as possible, so that the work can be properly scheduled without significantly disrupting CRP activities.

### ***Field Operations***

Traditional USGS field methods and procedures are the same for continuous records processing. Technological advances in field equipment in recent years have greatly changed the quantity and quality of data that can be collected and the time it takes to collect that data. As with any data collection activity, the hydrographer must be confident that the information gathered at the site is accurate and reliable. Reference materials for USGS standards and procedures for field techniques are available

through the various *Techniques of Water-Resources Investigations Reports* and other USGS methods reports.

Possibly most important, the definition of a field trip under the CRP model should incorporate not only field preparation and site visits, but also data entry and record computation. A field trip should not be considered complete until all these steps have been accomplished. Records processing should be initiated as soon as the field portion of the trip is completed, while the information from the trip is still fresh in the mind of the hydrographer.

An important factor in the success of CRP is to maximize efficiency in field activities. Some areas to evaluate for better efficiency include quality of station installations, field trip organization, and the use of new technology and automated processes:

- First, it is important to install and maintain high quality stations so time spent diagnosing and repairing problems is minimized. Real-time data must be monitored each day to verify that the equipment is working properly.
- Second, trip networks should be reviewed and routes should be periodically evaluated to insure that each trip is conducted as efficiently as possible to avoid redundant trips to the same geographic areas. Well planned networks can take into account periodic needs for additional personnel for activities such as station levels, boat measurements, and traffic control.
- Third, available technology should be used whenever possible to increase efficiency. For example the script Go2, available through the Office of Surface Water scripts web page, automatically tracks parameters such as DCP transmit time, battery voltage, and signal strength, and may aid the hydrographer in DCP troubleshooting. Any potential problems, such as low battery voltages, should be noted and corrected on routine field trips. Time will be saved and the quality of data will increase by being proactive rather than reactive concerning equipment problems. Efficiency and dependable data collection can be gained in the field by the use of acoustic technology, though time spent in the office may increase due to post processing of these data.
- Fourth, consider adopting improved methods for internet connectivity from the field such as wireless telephone cards for laptops.

## **Office Operations**

For adequate data quality control and assurance, office procedure for CRP should include a four-phase process; work, check, review, and approval of each record, with each phase being conducted by a hydrographer with appropriate experience. Depending on the available staff and/or the complexity of an individual record, an experienced hydrographer may perform both the check and review of the record as a single step. The hydrographer assigned to work the record should be the same person who collected the field data, when practical. Record processing should begin immediately after returning from the field. Reference materials for USGS standards and procedures for record computation techniques are available through the various *Techniques of Water-Resources Investigations Reports* and other USGS methods reports.

Processing records continuously will not lessen the overall time that is spent on records during the year. More time will likely be spent working records continuously simply because of the time it takes to become reoriented with a record each time it is processed. One advantage of processing records more frequently is that less experienced hydrographers become more proficient at records processing. The data are more familiar when processed immediately after the site visit, and field issues may be identified sooner when processing the records continuously. To have the time to process records continuously, it is important that the work conducted in the office be done as efficiently as possible. There are many tasks that can be evaluated and modified to save time in the office without jeopardizing the quality of the data.

## ***Management Practices***

**Establish Work Teams.** Establishing work teams will help facilitate CRP by insuring that all phases of the process are assigned and each hydrographer knows his/her responsibilities.

**Activity Scheduling.** It is crucial to the success of CRP to schedule all four aspects of CRP (site visits, record working, record checking, and record review). Maintaining and adhering to the schedule will facilitate the scheduling of other work such as projects, maintenance, vacation, and training during periods of non-CRP responsibilities.

**Record Tracking.** To manage the process of computing records continuously, it is essential that the records working progress is tracked. RMS is a database with a web interface developed to document and track record computations progress on a less than water year basis and is accessed through SIMS. RMS automatically emails personnel when the status (worked, checked, reviewed) of a record changes. RMS currently does not have an “approved” status, and that needs to be added to the system for management use. RMS reports the status of the record (date through which the record was worked, checked, and reviewed) and who performed each task. The user also has the capability of writing and storing the station analysis in RMS, along with comments exchanged between a record period’s worker, checker, and reviewer. With RMS, the user can easily identify which records are assigned to them and which records are ready to be worked, checked, or reviewed. Managers can use RMS to check the status of records for the office. By staying aware of the status of the records, necessary steps can immediately be taken to correct any problems concerning processing records continuously.

**Record Data Aging.** It should be noted that there is a difference between “Reviewed” and “Approved” record. Record for a particular site may be reviewed and that status reflected in RMS. However, there may be uncertainty with the data, such as an unsubstantiated shift or data correction, where more information would be useful in making a sound decision. In this case, the data are still reviewed and data aged to that status in ADAPS, but are not approved in ADAPS until additional data are available to make a sound decision on the quality of the record. Updating the aging status of the data in ADAPS to “in-Review” provides protection against accidental changes to the data before final approval. These periods will be displayed as “Provisional” on NWISWeb.

## ***Utilizing Tools and Aids***

Several tools, including programs and scripts, are available to aid in CRP. Many useful scripts are available on the Office of Surface Water data scripts webpage which can assist hydrographers and database administrators in working with data. Some of them are:

- Graphical Rating and Shift Application Tool (GRSAT) – a PC-based application that interacts with NWIS databases to provide a graphical interface to rating and shift development.
- SWReview facilitates the reviewing of stage-discharge records (qw\_uv for QW records) by combining many graphical elements within several tkg2 graphs.
- "Go2" is a program that determines where site visits are needed based on multiple criteria imbedded in several "tests". The program is highly customizable, but should provide you with a lot of useful information even if you stick with the default configuration values. The program is most useful when it is set up to run automatically, early each morning, and send its output to printers or though email.
- Automated Records Tool (ART) developed by the Indiana Water Science Center. ART is designed to automate the process of archiving discharge measurements and supporting data files, enter discharge measurements into NWIS, make an initial determination of rating shifts associated with a discharge measurement, apply the shifts based upon stage hydrographs, and re-compute the discharge record. Additional installations can not be supported without additional resources and/or headquarters support.
- Use existing NWIS comment fields to facilitate record-processing documentation at the time the records is being worked.

## **Additional Capabilities and Tools needed for Continuous Records Processing**

### ***Automated Records Computation and Data Entry***

The top priority identified by the committee for needed capabilities and tools is new automated ways to make routine decisions regarding shift and data corrections. In current procedures, hydrographers spend a great deal of time determining and implementing corrections. In a CRP process, if these corrections were determined by a computer software tool, the hydrographer would only need to verify the correction; in effect the working would be done by the software application and the hydrographer would be doing the checking of that work. That would leave far more time for the review and approval tasks required of each hydrographer. A prototype of this automatic correction tool has been developed and is currently operational in several WSCs. Further expansion of the concept proved by this prototype is a high priority for WRD.

Another needed automation tool is to have field-collected data entered automatically into the database. The current project of the National Water Information System (NWIS) development group is the Site Visit project which will do exactly this. This project has been implemented with the NWIS 4.8 release in August of 2008.



## ***Database Integration***

Databases need to be integrated to make CRP more efficient. Currently three different databases are used in the streamflow records process; the National Water Information System (NWIS), the Site Information Management System (SIMS) and the Records Management System (RMS). Each of these databases has specific purposes.

NWIS stores the data and some comments about that data, is the designated long-term archive of all hydrologic data, and is the source of information available to the public through NWISWeb. Data are marked as approved in the NWIS system. NWIS also produces an outline station analysis from information and comments stored in the database. Until the data are marked as approved within the NWIS database, they will be displayed on NWISWeb as “Provisional”.

SIMS stores the information about the site and is used for production of the Site Data Sheet for the Annual Water Data Report and, in many WSCs, is used for composing the Station Analysis for a time-series record. Revisions published in past Annual Water Data Reports are currently documented in SIMS. A Revisions History may be a SIMS element until the NWIS database can store this information (see Appendix B).

RMS documents when specific steps in the records analysis are completed and who performs those steps. It can be used to monitor progress and can also contain the information needed for Station Analysis documentation. RMS currently is the recommended tracking mechanism needed for CRP.

The committee recommends that all these functions eventually be merged into the NWIS database. However, for the short term the SIMS and RMS databases have been integrated to provide the user with a common platform and access point. The NWIS and SIMS/RMS groups need to discuss plans for complete integration as soon as possible.

## ***Documentation - New Procedures and Tools for the Station Analysis***

The station analysis is a very important document that defines the problems, processes, corrections, and logic of hydrologic record computations for a particular site. Traditionally, station analyses have been written for a water-year period. However, with CRP, the periods that need to be documented are shorter and a different format will be needed. Both the traditional summary documentation for the water year and new shorter-time frame analyses will be valuable. The committee recommends that some sort of Station Analysis Wizard be developed to allow easy entry of necessary information and to produce analysis documents for any time period desired. A subcommittee has developed the requirements and templates for this necessary documentation tool (see Appendix C). Evaluation of the most effective way to meet these requirements is underway.

## ***Policy and Guidance Memoranda***

Policies and guidance are needed for identifying the information to include in a CRP Station Analysis, and whether it is different from the Station Analysis requirements outlined in Rantz (WSP 2175). In addition, basic guidance of what is required for checking and reviewing a hydrologic record would aid CRP, and a policy formally defining “published” data is needed. Lastly, policy and guidance

is needed for handling revisions made within a water-year period. The committee presents a process for tracking revisions with CRP in Appendix B.

## ***Training***

The Water Science Centers need to be kept informed regarding the CRP implementation plans. Two Town Hall meetings have been held via cyber seminar to explain the committee's views on the process and to give WSCs examples of how CRP works in various locations. These will be followed by additional cyberseminars as plan details are finalized. The Technical Offices will develop policy/guidance memorandums as needed and distribute those to the WSCs. Memorandums will be accompanied by cyber seminars if deemed necessary.

Additionally, training is needed for hydrographers to feel comfortable and capable of reviewing and approving hydrologic records. A series of cyber seminars outlining recommended review practices and approval responsibilities is planned to be developed and presented.

## **Recommendation for Oversight Group for Needed Future Tools, Enhancements, and Capabilities**

The CRP Committee feels that there is a definite need for some group to shepherd and oversee needed changes regarding Continuous Records Processing. This assignment could be made to a new or existing group such as the Surface Water Users Group or the continuous Monitors Users Group. Oversight can help to insure that CRP is implemented consistently and appropriately across the Disciplines and help to provide expertise in developing needed tools and capabilities.

## **Existing References and Guidance available for Continuous Records Processing**

### ***Surface and Groundwater***

Many USGS reports on water resources are now served online. The USGS series of Techniques of Water-Resources Investigations Reports can be accessed at: <http://pubs.usgs.gov/twri/> or <http://pubs.usgs.gov/tm/>.

Use of the Program HYDRA to Estimate or Modify Unit Values in ADAPS. Office of Surface Water Technical Memorandum No. 2005.07 <http://water.usgs.gov/admin/memo/SW/sw05.07.html>

Groundwater-Level Monitoring and the Importance of Long-Term Water-Level Data U.S. Geological Circular 1217 by Charles J. Taylor and William M. Alley. <http://pubs.usgs.gov/circ/circ1217/>

## ***Water Quality***

Guidelines and standard procedures for continuous water-quality monitors—Station operation, record computation, and data reporting: U.S. Geological Survey Techniques and Methods; Wagner, R.J., Boulger, R.W., Jr., Oblinger, C.J., and Smith, B.A., 2006, <http://pubs.water.usgs.gov/tm1d3>

National field manual for the collection of water-quality data: U.S. Geological Survey Techniques of Water-Resources Investigations, book 9, chaps. A1-A9. <http://pubs.water.usgs.gov/twri9A>

## **Appendix A. — A Proposed Approach for Evaluating the Effect of CRP on Historical and Real-time Data Quality**

The Committee feels it is very important to quantify the effect of CRP on the quality of historic and real-time records in order to address existing and potential questions within and outside the USGS regarding CRP.

There are many approaches that could be used to address the effects of CRP on data quality. One approach is provided here, but can be modified or replaced as needed based on broader feedback. The approach is modeled after that used by Melcher and Walker in their 1992 evaluation of methods of computing ice records (WSP 2378).

A record will be analyzed two different ways. The CRP analysis will consist of full implementation of data-driven CRP processing. The End-of-Year (EOY) analysis will consist of the "traditional" records-processing procedure at the end of the water year. It is expected that the EOY processing will consist of some "continuous" tasks related to keeping the record on NWISWeb current, such as development of preliminary shifts.

- Select a representative sample of stations of varying hydrologic, water-quality and hydraulic characteristics from WSCs fully implementing CRP.
- Establish a parallel site in NWIS and NWISWeb (local access only) such that all data are processed into each site. These sites will be maintained by two different hydrographers using CRP and EOY processes independently of each other to produce both real-time and final records.
- Process the records from each using CRP techniques as normal throughout the study year.
- Within each WSC select an experienced employee with knowledge of the station to process the record using EOY techniques. This may include processing preliminary shifts throughout the year as measurements are made, as well as full analysis at the end of the year. This employee should have access to the same basic data as that used by the CRP analyst, but should not have access to the CRP analysis itself (neither during the year or at the end). The employee should not have been involved in the CRP analysis of that station or other stations in the vicinity. This analysis should be checked and reviewed as normal but without reference to the CRP analysis or data.
- Each day retrieve and archive the last 30 days of unit values from NWISWeb for each site.
- During the year, make several extra measurements (at least 6-10) at varying flows and times by an employee not involved in either the CRP or end-of-year (EOY) analysis. The time and flow of these measurements is not made available to either the CRP or EOY analyst.
- Statistically compare the difference between both the CRP and the EOY analysis with the flow measured by the extra discharge measurements. Three differences will be compared:

1. The difference of each measurement to the final data (to assess the quality of the historical record)
2. The difference of each measurement from the NWISWeb data as retrieved at the time of the measurement (to assess the quality of the current real-time data)
3. The difference of each measurement from the NWISWeb data as retrieved one week after the measurement (to assess the quality of the recent data as affected by the initial processing of the measurement)

It is recognized that there are several assumptions in this approach, one being that the employee doing the CRP analysis and the employee doing the EOY analysis do work of comparable quality so that the differences are related to the technique and not the analyst. As with the Melcher and Walker study, it is hoped that with proper study design these issues can be minimized.

## **Appendix B.--A Proposed Interim Process for Tracking Revisions to Hydrologic Data in NWISWeb and the Annual Water Data Report**

Revisions to approved Daily Value data from previous Water Years are adequately tracked in Annual Water Data Reports (ADRs) using protocols outlined in Novak (1985); however, there are no protocols for tracking within-year revisions to data that are approved on a less-than-annual basis or for instantaneous values that may be available real-time or through the Instantaneous Data Archive (IDA). With the implementation of Continuous Records Processing, it is necessary that a process be available to document within-year revisions to data that are approved/published during a sub-water-year period.

Currently, once data are approved in ADAPS, they are immediately coded as approved in NWISWeb. Therefore, it is important to create a process whereby a log of within-year revisions is automatically delivered to NWISWeb. Currently, the practice has been to add a manual remark to the NWISWeb site display that identifies periods of data revision. Some problems with this process are that it requires a case-by-case manual insertion, it is not explicitly required, implementation is not consistent, and it may not include any indication of previous revisions to records.

### ***Background***

This document presents pertinent background information including selected definitions and revision elements contained in SIMS; a summary of existing procedures for tracking revisions in the ADR; and a new process for tracking within-year revisions in NWISWeb that is necessitated by Continuous Records Processing.

This proposed process is intended to be an interim solution. The final process and protocol should have a revisions history stored in the NWIS database and the data and information flagged as “revised from a previously approved value.” This will allow users to track and use the most recent and accurate data directly from the database without having to search for possible revisions to previously obtained data.

### **Definitions**

The following definitions are based on Novak (1985).

**Corrections** – Changes to published information that is derived from basic data, such as totals or statistical summaries.

**Discredited Records** – Published basic-data records that are found to be seriously in error and for which there is no basis to make reliable revisions.

**Revisions** – Changes to published basic-data records that are substantially in error. The criteria for conditions that warrant revision are explicitly defined in Novak (1985) and Technical Memoranda of the USGS Water Discipline.

Published Data – For purposes of Continuous Records Processing, data are considered to be published when they are marked as approved in NWISWeb.

## **Revision Elements in the Site Information Management System (SIMS)**

The following information about revised data can be tracked in the Site Information Management System (SIMS).

### **Station Description**

The Station Description is an internal document and information is not intended for distribution outside of USGS. It could contain proprietary or private information.

The REVISIONS element is available in SIMS to store information concerning data revisions, but is not available outside of USGS.

### **Station Analysis**

The Station Analysis is an internal document but is available for review outside of USGS. It must not contain any proprietary or private information.

The REVISIONS (SANAL) element is available in SIMS to store information concerning data revisions made within the time period of the Station Analysis. In traditional usage the time period of the Station Analysis has been the Water Year.

### **Manuscript**

The Manuscript is part of SIMS and is used to generate a public document called the Site Data Sheet. It must not contain any proprietary or private information.

There are several elements included in the Manuscript section of SIMS that are available to store information concerning data revisions made within the time period of the Manuscript. In traditional usage the time period of the Manuscript has been the Water Year.

REVISIONS (MANU) is used to present revised data of any type. In traditional usage revised data are from a prior Water Year, but may be from any prior period of data publication.

REVISED RECORDS is used to identify the publications in which revised surface- and Groundwater quantity data have been published. The contents of Revised Records are persistent and must not be deleted or altered from year to year.

REVISED RECORDS (CLIM) is used to identify the publications in which revised climatological or atmospheric data have been published. The contents of Revised Records are persistent and must not be deleted or altered from year to year.

REVISED RECORDS (WQ) is used to identify the publications in which revised water-quality data have been published. The contents of Revised Records are persistent and must not be deleted or

altered from year to year.

CORRECTIONS is used in the narrowly defined case when summaries of basic data such as totals, maximum, or minimum are in error. In traditional usage corrections are for data from a prior Water Year and are only identified at the time they are made.

### ***Publishing Revisions in Annual Water Data Reports***

Revisions to Water Year data published previously in ADRs or Water-Supply Papers are incorporated automatically into annual Site Data Sheets by Automated Data Report Processing scripts and included in the most current Annual Water Data Report. Revisions in the ADR are initially presented using the REVISIONS (MANU) element. REVISIONS are only included on the Site Data Sheet for the year in which they are actually done (not the year to which they refer). The elements REVISED RECORDS, including (CLIM) and (WQ), are used to provide a REVISED RECORDS history on all Site Data Sheets, if any such revisions have ever occurred.

#### **Examples:**

REVISIONS.--The maximum and minimum discharges for water year 1971 have been revised to 66,000 ft<sup>3</sup>/s, Dec. 9, 1970, gage height 19.42 ft and 1,050 ft<sup>3</sup>/s, Sept. 30, 1971, gage height 0.62 ft, respectively. They supersede figures published in the report for 1971.

REVISED RECORDS.--WSP 1715: 1948, 1955. WDR CA-75-1: 1974.

The Site Data Sheet for subsequent Water Years will not include the REVISIONS element (unless there are any new revisions) and an updated REVISED RECORDS history as follows:

REVISED RECORDS.—WSP 1715: 1948, 1955. WDR CA-75-1: 1974. WDR-US-2007: 1971.

### ***Publishing Revisions in NWISWeb***

The existing REVISIONS (SANAL) element will be used to summarize revisions made within a given Water Year. This approach will require accumulating revision notations during a Water Year, and will also require the use of the SIMS Station Analysis for recording within-year revisions. Because any statement of revisions will be subject to open viewing by the public, special care must be taken in composition and review, which should include the Data Chief or other delegated official. With the planned inclusion of Records Management System (RMS) functions into SIMS and the potential development of a Station Analysis Wizard, a transparent and consistent transition to a future approach must be also considered.

A direct and automatic link will be established between SIMS and NWISWeb to extract the contents of the REVISIONS (SANAL) in order to immediately upload any revised data to NWISWeb. This link will also be used to upload REVISED RECORDS, REVISED RECORDS (CLIM), and REVISED RECORDS (WQ) elements into the NWISWeb site display as needed. It is important to note that the implementation of this proposed link must be requested through the NWISWeb Users Group for evaluation and approval by the NWIS Executive Steering Committee as a NWISWeb development



project.

REVISIONS (SANAL) will only be included on the NWISWeb site display for the year in which they are actually done (not the year to which they refer). The elements REVISED RECORDS, including (CLIM) and (WQ), will be used to provide a REVISED RECORDS history on the NWISWeb site display, if any such revisions have ever occurred.

**Examples:**

REVISIONS.--Discharge records have been revised for July 17-20 and August 1-5, 2007.

REVISED RECORDS.--WSP 1715: 1948, 1955. WDR CA-75-1: 1974.

All within-year REVISIONS details will be maintained in a persistent public data base linked to REVISED RECORDS in NWISWeb, and can be removed from active display following publication of the respective Annual Water Data Report.

**References**

Novak, C.E., 1985, WRD data reports preparation guide: U.S. Geological Survey Open File Report 85-480, <http://pubs.er.usgs.gov/usgspubs/ofr/ofr85480>

USGS, 2006, Approval and revision of time-series data in ADAPS 4.6: Office of Surface Water Technical Memorandum 2006.05, <http://water.usgs.gov/admin/memo/SW/sw06.05.html>

USGS, 2007, Changes to the NWISWeb aggregation and display of water-quality data: Office of Water Quality Technical Memorandum 2007.03, <http://water.usgs.gov/admin/memo/QW/qw07.03.html>

USGS, 2007, Controlling flow of water-quality data to NWISWeb: Office of Water Quality Technical Memorandum 2007.04, <http://water.usgs.gov/admin/memo/QW/qw07.04.html>

## Appendix C.—Station Analysis Wizard Requirements

### ***Station Analysis Basics***

The station analysis will consist of a series of elements. Each element will have two potential parts. One part will be free text as entered by the user. The second part will be information retrieved from the NWIS database by the wizard upon user request. Each element will have a specific date range which will not necessarily correspond to the date range of another element. This will allow the use of consistent application through time of information that does not change without requiring the user to repeat it for each analysis period.

### ***Station Analysis Types***

The type of station analysis will be defined at the ADAPS data descriptor level. Each DD will be categorized under a specific station analysis type. This will allow the wizard to know what elements to apply to a station by default and to warn the user of missing elements, while still providing the functionality of having elements very specific to certain types of stations. The following site types are included for now but others may be needed, in particular for specialty computations such as index-velocity, slope, or surrogate QW stations.

sw	Surface water discharge
gw	Groundwater level
qw	Surface or Groundwater quality
Gn	Generic time-series parameter (catch all default) – includes precipitation, stage-only, etc.

### ***Station Analysis Elements***

The elements defined for the station analysis are as follows, along with the expected user and ADAPS content. Some elements will not have user content and others will only have user content. Other elements not listed may be needed to address specialty analysis types like index-velocity, slope, or surrogate QW if they get created.

**Name:** Header (HEAD)

**Analysis Types:** sw, gw, qw, gn

**User Content:** None

**ADAPS Content:** None

(This element is not seen by the user but exists in the database to drive the dates of the overall “station analysis period.” This is necessary because any given element can have application dates different than the period created so there needs to be something to set the period. The easiest approach seemed to be to create another element to do this but let it work behind the scenes, because this seemed to fit with the presumed database structure. Clearly this approach can and should be changed as needed during implementation.).

**Name:** Equipment (EQIP)

**Analysis Types:** sw, gw, qw, gn

**User Content:** Describe equipment, including primary sensor and recorder, backup equipment, primary reference gage, other reference gages, power supply, and telemetry. Note changes to equipment during the analysis period.

**ADAPS Content:** None at first, but could eventually tie to ADAPS equipment and sensor tables in site visit.

**Name:** Site Characteristics (CHAR)

**Analysis Types:** sw, gw, qw, gn

**User Content:** Describe the physical characteristics of the site location relative to the type of time-series data collected. For a discharge site this would be a description of the stream reach and control information. For a surface-water water-quality site this would be a description of the stream reach, sensor location, type of installation, and sampling location. For a groundwater site this would be a description of the aquifer. Etc.

**ADAPS Content:** None

**Name:** Time-Series Record (TIME)

**Analysis Types:** sw, gw, qw, gn

**User Content:** Identify and describe time-series data during period. Describe problems, accuracy, missing and discounted data, and source (use of backup data).

**ADAPS Content:** UV inventory or other summary of UV availability in database. Summary of erroneous data.

**Name:** Levels and Datum Corrections (LEVL)

**Analysis Types:** sw, gw

**User Content:** Identify levels run during the analysis period and the results, including any gage resets and datum corrections. Consider causes of datum corrections applied.

**ADAPS Content:** None until levels information is in database.

**Name:** SW Site Visits (SWST)

**Analysis Types:** sw

**User Content:** Not much, but include any general info on site visits.

**ADAPS Content:** Summary of SW site visits, including measurements

**Name:** GW Site Visits (GWST)

**Analysis Types:** gw

**User Content:** Not much, but include any general info on site visits. **ADAPS Content:** Summary of GW site visits, including GWSI readings

**Name:** QW Site Visits (QWST)

**Analysis Types:** qw

**User Content:** Not much, but include any general info on site visits. The Continuous Water Quality Monitor form includes fields like gage height and status, channel conditions, and weather conditions. **ADAPS Content:** Summary of QW site visits

**Name:** Site Visits (GNST)

**Analysis Types:** gn

**User Content:** Not much, but include any general info on site visits.

**ADAPS Content:** Summary of generic site visit info

**Name:** Data Corrections (CORR)

**Analysis Types:** sw, gw, qw, gn

**User Content:** Describe the application of any data corrections in the period – presumed cause and rational for the application of each correction. For water quality or atmospheric sites this includes both cleaning and calibration corrections.

**ADAPS Content:** Data Corrections and comments retrieval

**Name:** Rating Curve (RATE)

**Analysis Types:** sw

**User Content:** Describes the rating itself at the time of its development.

**ADAPS Content:** Rating retrieval (w/o dates)

**Name:** Rating and Shift Analysis (RAAN)

**Analysis Types:** sw

**User Content:** Describe the application of the rating and shifts during the analysis period and the use of measurements made to confirm/develop ratings and/or shift. Discuss the presumed cause and rational for the application of each rating and shift, including both the timing of each rating/shift as well as the shape of each rating/shift. The difference between this element and the “Rating Curve” element is that the rating curve element is primarily written once and applies to the entire period of the rating whereas this element is new for each analysis period. This allows us to print out the basic rating info in the analysis but not repeat it for each analysis period. We do, however, put the rating dates in this element so that they are retrieved and documented each time.

**ADAPS Content:** shift retrieval, shift analysis, rating dates

**Name:** Cross-section surveys (XSEC)

**Analysis Types:** qw

**User Content:** Describe any cross-section surveys made during the analysis period and the results.

**ADAPS Content:** None until these are stored in ADAPS

**Name:** Vertical profiles (PROF)

**Analysis Types:** qw

**User Content:** Describe any vertical profiles made during the analysis period and the results.

**ADAPS Content:** None until these are stored in ADAPS

**Name:** Aquifer tests (ATST)

**Analysis Types:** gw

**User Content:** Describe any aquifer tests made during the analysis period and the results.

**ADAPS Content:** None but perhaps future link to GWSI??

**Name:** Computations (COMP)

**Analysis Types:** sw, gw, qw, gn

**User Content:** Describe the basic computations method and any special computation method including estimates. Describe any method used to confirm the data (e.g. comparison with another site.)

**ADAPS Content:** DV/UV write protected data summary

**Name:** Remarks (RMKS)

**Analysis Types:** sw, gw, qw, gn

**User Content:** Rate the quality of the record and any other remarks related to the period not specifically included in another element.

**ADAPS Content:** None

**Name:** Recommendations (RCMD)

**Analysis Types:** sw, gw, qw, gn

**User Content:** Recommendations on future actions to take in the collection and/or processing of the time-series data or during a future site visit.

**ADAPS Content:** None

**Name:** Revisions (REVS)

**Analysis Types:** sw, gw, qw, gn

**User Content:** Discuss and track revisions made to the analysis period after the point of initial data approval.

**ADAPS Content:** None

**Name:** Extremes (EXTR)

**Analysis Types:** sw

**User Content:** Document extremes for a given water year and comparisons to corroborating evidence from HWMs, CSG readings, max/min clips.

**ADAPS Content:** EOY Summary and Site Visit Peak Summary Report

**Name:** Records Dialog (DLOG)

**Analysis Types:** sw, gw, qw, gn

**User Content:** Specific comments between the work/check/review personnel for this period regarding the processing of the time-series data.

**ADAPS Content:** History of changes to aging of analysis period

## ***Station Analysis Wizard Requirements***

1. The user will supply an agency code, station ID, and Data Descriptor. The user will then be allowed to:
  - a. select a current analysis period for editing, processing
  - b. create a new period.
    - i. If creating a new period the user will supply a starting and ending date.
    - ii. The wizard will ensure that the date does not conflict with existing analysis periods.
    - iii. The creation of a new period shall result in a new HEAD element, which will set the dates of analysis period only. Users shall not be able to select, edit, copy, or delete HEAD elements.

2. When a new analysis period is created the user will be lead through each element pertaining to the type of analysis assigned to that DD.
  - a. For each element the user is shown the contents of that element in the prior analysis period in a non-editing fashion and is provided the following option.
    - i. Keep the most recent prior version and update the end time to correspond to the end time of the user specified period. (assuming an earlier version of the element exists)
    - ii. Copy the most recent prior version of the element to a new element with the start and end date of the user specified period and open it for editing. (assuming an earlier version of the element exists)
    - iii. Create a new blank element with the start and end date/time of the user specified period and open it for editing.
    - iv. Skip the element
  - b. For each element once initially populated, the user will be provided two displays. One display will be of the free text version of the element. The user will be allowed to edit this field with a text editor (including spell checking). The second display will be of the ADAPS content. The user will be allowed to delete this content or replace it with a new retrieval from ADAPS with a simple retrieval button. The user will not be allowed to directly edit it the ADAPS content.
  - c. When done editing an element the user will automatically move to the next element, but will be able to abort the process at any time.
3. If an existing analysis period is selected the user will be allowed to:
  - a. Move through the existing elements one by one with the same editing features as above.
  - b. Select a specific element to edit. Edit functions shall include
    - i. Editing the user content.
    - ii. Updating the ADAPS content
    - iii. Adjusting the start or end date of the element
      - a) When adjusting the start or end date of the element the user shall be forced to select dates equal to the start or end date of existing non-approved/checked analysis periods that are adjacent in time to the existing period. In other words the user can back the start date up or move the end date forward one analysis period at a time until he or she hits an approved or checked period.
  - c. Create a new element that does not currently exist.
    - i. This delete shall remove of an element type that does not normally apply to the analysis period assigned to the DD shall be allowed, but the user shall be required to acknowledge a warning prior to creating the element.
    - ii. The period for the new element shall match the analysis period
  - d. Delete an existing element.
  - e. Delete the entire analysis period
    - i. This delete shall remove the HEAD element (and shall be the only action that deletes a HEAD element)
    - ii. This delete shall not be performed if any other element has a period of application that overlaps the starting/ending dates of the analysis period. When this occurs the user shall be provided a list of elements that exist in the period to be deleted and shall be required to delete or modify their dates prior to deleting the analysis period.
    - iii. The delete shall only be performed if the analysis period is working or worked.
  - f. Set the status of the analysis period.

- i. The following status categories shall exist.
  - Working
  - Worked
  - Checked
  - Approved
- ii. Only the following changes in category shall be allowed
  - Working to worked
  - Worked to working
  - Worked to checked
  - Checked to working
  - Checked to approved
- iii. When setting the status from working to worked, from worked to checked, or from checked to approved the user shall be forced to acknowledge a warning if any standard elements for the analysis type defined for that site/DD are missing.
- g. Update the ADAPS content for all existing elements in one step.
- h. For the analysis period selected, the user will be shown which elements exist in relation to the normal element list for the current data type.
4. A spell checker shall exist as part of the editing function of each element. The spell checker shall only check the user content of the element.
5. When the analysis period is initially created it shall be set to the working status.
6. Changes to the status will result in the following actions
  - a. Change from working to worked: email to checker, cc to worker
  - b. Change from worked to working: email to worker cc to checker
  - c. Change from worked to checked: email to reviewer, cc to worker and checker – **data in ADAPS set to in-review (if currently working).**
  - d. Change from checked to working: email to worker, cc to checker and reviewer – **data in ADAPS set to working (if currently in-review).**
  - e. Change from checked to approved: email to worker, cc to checker and reviewer – **data in ADAPS set to approved (if current in-review).**
  - f. Change from approved to working: email to worker, cc to checker and reviewer – **data in ADAPS set to working.**
  - g. **If the data aging change in ADAPS fails (consistency error, etc.) then the user will be given a fatal error with details and the status of the station analysis period will be left alone.**
  - h. Actions that result in changes in the data in ADAPS will only be allowed by users who have the ability to make those changes in ADAPS.
  - i. When setting ADAPS data aging the ADAPS data aging period end date will be one day prior to the station analysis end date.
7. The content of elements of a station analysis used for any checked analysis period will still be editable, but the starting/editing dates shall not.
8. The contents of elements of a station analysis used for any approved analysis period will not normally be editable, but an over-ride feature will exist to allow users to make editorial changes to the user content only without resetting the analysis status.
9. An option shall exist to allow a user to adjust the start/end date of all elements at one time
  - a. Any adjustment made to a start or end date will apply to all elements that use the same start/end date, including the HEAD element.

- b. Adjustments that cause overlap with other analysis periods shall not be allowed.
- c. The adjustment shall only be allowed if the analysis period is working or worked.
- d. Adjustments that cause a gap in the analysis record shall **be** allowed.
- e. The user shall be provided the opportunity to update the ADAPS content for all existing elements in one action whenever the common start/end date is modified.

## **Station Analysis Retrieval Requirements**

1. The user will supply an agency code, station ID, and Data Descriptor.
2. The user shall be given a choice to
  - a. Select a specific analysis period
  - b. Select a consecutive range of analysis periods
  - c. Specify any date range
3. The resulting analysis report will show any analysis elements that exist in the period specified.
4. Two output formats shall be available
  - a. **Period ordered:** Each analysis period shall be provided separately, with each existing element listed under each period.
  - b. **Element ordered:** All elements shall be listed together for the entire period.
5. The status (approved, checked, etc) shall be shown with each element in both reports and additionally with each period in a period ordered report.
6. Each element retrieved shall be shown with both parts – the User content and the ADAPS content
7. The user shall be able to retrieve the report to the screen, directly to a file, or directly to a printer.

### **Annotated outline of example *period ordered report:* (annotation in italic blue text)**

#### **Retrieval period October 1, 2006 to December 31, 2007**

*Assume retrieval period contains the following analysis periods:*

*08/12/2006 to 10/15/2006 – Approved (note that this period starts prior to the start of the retrieval period. The user is not forced to do a report based on specific analysis periods. Any analysis period that overlaps the retrieval period will be included.)*

*10/16/2006 to 05/10/2007 – Checked*

*05/11/2007 to 10/22/2007 – Worked*

*10/23/2007 to 12/08/2007 – Working*

*12/09/2007 to current – not yet part of any defined analysis period*

**Analysis period 08/12/2006 to 10/15/2006** *Analysis period that covers the start of the retrieval period. This period is approved.*

- Equipment – element period 06/15/2005 to 05/10/2007 *This equipment paragraph has been in use without change for two years and already continues in use through to May 2007 – but not all the way to current, which means there must be some change in May 2007 – see below.*
- Site Characteristics – element period 05/05/2000 to 12/08/2007 *This one is even longer because characteristics don't really change that much and this one continues all the way through to the most recent defined period.*



- Time Series Record – element period 08/12/2006 to 10/15/2006 *First element using the specific analysis period*
- Levels and Datum Corrections - element period 09/12/2006 to 10/15/2006 *Another element using the specific analysis period*
- SW Site Visits - element period 08/12/2006 to 10/15/2006 *Another element using the specific analysis period*
- Data Corrections - element period 08/12/2006 to 10/15/2006 *Another element using the specific analysis period*
- Rating Curve - element period 10/01/2002 to 12/08/2007 *This rating paragraph has been in effect since the rating was developed in 2002.*
- Rating and Shift Analysis - element period 08/12/2006 to 10/15/2006 *Another element using the specific analysis period*
- Computations - element period 08/12/2006 to 10/15/2006 *Another element using the specific analysis period*
- Remarks - element period 08/12/2006 to 10/15/2006 *Another element using the specific analysis period*
- Recommendations - element period 08/12/2006 to 05/10/2007 *This element actually starts here but goes forward to the next period too.*
- Records Dialog - element period 08/12/2006 to 10/15/2006 *Another element using the specific analysis period*

**Analysis period 10/16/2006 to 05/10/2007** *The second analysis period during the retrieval period. This period is checked.*

- Equipment – element period 06/15/2005 to 05/10/2007 *The same equipment paragraph as in the prior analysis period. Note not just a “copy” but the same paragraph.*
- Site Characteristics – element period 05/05/2000 to 12/08/2007 *The same characteristics paragraph as in the prior analysis period.*
- Time Series Record – element period 10/16/2006 to 05/10/2007 *But this one again is tied to the specific analysis period*
- Levels and Datum Corrections - element period 10/16/2006 to 05/10/2007 *As is this one and all the others in this analysis period*
- SW Site Visits - - element period 10/16/2006 to 05/10/2007
- Data Corrections - - element period 10/16/2006 to 05/10/2007
- Rating Curve - element period 10/01/2002 to 12/08/2007 *This one, however, is the same rating paragraph as the prior analysis period*
- Rating and Shift Analysis - - element period 10/16/2006 to 05/10/2007 *Back to paragraphs specific to the analysis period*
- Computations - - element period 10/16/2006 to 05/10/2007
- Remarks - - element period 10/16/2006 to 05/10/2007
- Recommendations - element period 08/12/2006 to 05/10/2007 *Same element period as before. Same recommendation still applies.*
- Records Dialog - - element period 10/16/2006 to 05/10/2007

**Analysis period 05/11/2007 to 10/22/2007** *The third analysis period during the retrieval period. This period is worked.*

- Equipment – element period 05/11/2007 to 12/08/2007 *A new equipment paragraph driven by some change in the equipment (see example report below), but note that new paragraph continues on through to the most recent defined period.*
- Site Characteristics – element period 05/05/2000 to 12/08/2007 *Still the same characteristics paragraph.*
- Time Series Record – element period 05/11/2007 to 10/22/2007 *Again tied to the specific analysis period*
- Levels and Datum Corrections - element period 05/11/2007 to 10/22/2007
- SW Site Visits - element period 05/11/2007 to 10/22/2007
- Data Corrections - element period 05/11/2007 to 10/22/2007
- Rating Curve - element period 10/01/2002 to 12/08/2007
- Rating and Shift Analysis - element period 05/11/2007 to 10/22/2007
- Computations - element period 05/11/2007 to 10/22/2007
- Extremes - element period 05/11/2007 to 10/22/2007 *Because this analysis period crosses the water year the user inserts an extremes element to track the peaks and min for the water year. Although it has the same analysis period it actually contains the extremes information for the entire year. There likely need to be special rules for this element in the ADAPS content to tie it to the water year.*
- Remarks - element period 05/11/2007 to 10/22/2007
- ~~Recommendations – element period 05/11/2007 to 10/22/2007~~ *Took this one out. Previous recommendation finally taken care of.*
- Records Dialog - element period 05/11/2007 to 10/22/2007

**Analysis period 10/23/2007 to 12/08/2007** *The fourth analysis period during the retrieval period. This period is working, which means it is a work in progress.*

- Equipment – element period 05/11/2007 to 12/08/2007 *The same new equipment paragraph that was started last period.*
- Site Characteristics – element period 05/05/2000 to 12/08/2007 *Still the same old site characteristics.*
- Time Series Record – element period 10/23/2007 to 12/08/2007 *As usual tied to the specific analysis period*
- Levels and Datum Corrections - element period 10/23/2007 to 12/08/2007
- SW Site Visits - element period 10/23/2007 to 12/08/2007
- Data Corrections - element period 10/23/2007 to 12/08/2007
- Rating Curve - element period 10/01/2002 to 12/08/2007
- ~~Ratings and Shift Analysis – element period 10/23/2007 to 12/08/2007~~ *Don't have this one yet because the user has not gotten that far in records work.*
- ~~Computations – element period 10/23/2007 to 12/08/2007~~ *Don't have this one yet because the user has not gotten that far in records work.*
- ~~Extremes – element period 10/23/2007 to 12/08/2007~~ *Don't have this one in this analysis period because not crossing the water year this time.*
- Remarks - element period 10/23/2007 to 12/08/2007 *Maybe this one exists but only in draft form.*
- ~~Recommendations – element period 10/23/2007 to 12/08/2007~~ *No new recommendations.*
- Records Dialog - element period 10/23/2007 to 12/08/2007 *Worker already has this started to write some notes to checker.*

**Analysis period 12/09//2007 to current** *This analysis period does not exist yet so no elements apply. Report will simply note that fact.*

**Annotated outline of example *element* ordered report:** *(annotation in italic blue text)*

**Retrieval period October 1, 2006 to December 31, 2007** *Same report as above example just with different report order*

Equipment

- element period 06/15/2005 to 05/10/2007
- element period 05/11/2007 to 12/08/2007 *Second period to reflect that change in equipment in May.*

Site Characteristics

- element period 05/05/2000 to 12/08/2007 *Just one site characteristics element for the entire retrieval period*

Time Series Record

- element period 08/12/2006 to 10/15/2006 *For this element a unique paragraph for each analysis period.*
- element period 10/16/2006 to 05/10/2007
- element period 05/11/2007 to 10/22/2007
- element period 10/23/2007 to 12/08/2007

Levels and Datum Corrections

- element period 08/12/2006 to 10/15/2006 *For this element a unique paragraph for each analysis period.*
- element period 10/16/2006 to 05/10/2007
- element period 05/11/2007 to 10/22/2007
- element period 10/23/2007 to 12/08/2007

SW Site Visits

- element period 08/12/2006 to 10/15/2006 *For this element a unique paragraph for each analysis period.*
- element period 10/16/2006 to 05/10/2007
- element period 05/11/2007 to 10/22/2007
- element period 10/23/2007 to 12/08/2007

Data Corrections

- element period 08/12/2006 to 10/15/2006 *For this element a unique paragraph for each analysis period.*
- element period 10/16/2006 to 05/10/2007
- element period 05/11/2007 to 10/22/2007
- element period 10/23/2007 to 12/08/2007

Rating Curve

- element period 10/01/2002 to 12/08/2007 *this element just one entry for the analysis period as the rating never changes*

Rating and Shift Analysis

- element period 08/12/2006 to 10/15/2006 *For this element a unique paragraph for each analysis period.*

- element period 10/16/2006 to 05/10/2007
- element period 05/11/2007 to 10/22/2007
- element period 10/23/2007 to 12/08/2007

#### Computations

- element period 08/12/2006 to 10/15/2006 *For this element a unique paragraph for each analysis period.*
- element period 10/16/2006 to 05/10/2007
- element period 05/11/2007 to 10/22/2007
- element period 10/23/2007 to 12/08/2007

#### Extremes

- element period 05/11/2007 to 10/22/2007 *For this element just one entry for the analysis period spanning the water year boundary.*

#### Remarks

- element period 08/12/2006 to 10/15/2006 *For this element a unique paragraph for each analysis period.*
- element period 10/16/2006 to 05/10/2007
- element period 05/11/2007 to 10/22/2007
- element period 10/23/2007 to 12/08/2007

#### Recommendations

- element period 08/12/2006 to 05/10/2007 *For this element just one entry spanning a portion of the period.*

#### Records Dialog

- element period 08/12/2006 to 10/15/2006 *For this element a unique paragraph for each analysis period.*
- element period 10/16/2006 to 05/10/2007
- element period 05/11/2007 to 10/22/2007
- element period 10/23/2007 to 12/08/2007

## **Testing a Station Analysis Wizard with Example Use Cases**

Use cases are examples of actual user functions that are done using the software. These are good tests of “does the software actually allow the user to do what needs to be done” and help the developer understand more clearly the intent of the software. Review of the use cases also helps uncover holes in the software design by pointing out functions that will need to be done that can’t under the current design – as in “what about when I want to do *this...*?” They also lead to specific “test cases” which are used to actually test the software once written. Test cases would come later.

## **Additional functions for a Station Analysis Wizard**

The Station Analysis Wizard relates to all of the other tasks associated with continuous records processing, but two items in particular are discussed here.

- Tracking metric – the committee has developed CRP metrics that rely on the classification of time-series data into 3 categories depending on how long the data is expected to take to get to approved under typical conditions. If this system is implemented, there will need to be a spot

where a category can be assigned to each time-series dataset. (Note that this is not at the station level because a station may have one dataset in one category (i.e. discharge) and another dataset a different category (i.e. QW monitor data). Although it is not required, it makes sense that adding a spot in the database to store these classifications be considered as part of the database changes needed for the wizard.

- Reports – it is also understood that there must be various output reports which track the status of continuous records processing at various organizational levels (employee, field office, WSC, Region, USGS), as is currently done in SIMS/RMS. Again while it is not required that these reports come out of the work done to implement the station analysis wizard, as outlined this document provides the database structure to supply all of the information behind such reports (or at least that is the authors intent). It thus makes sense that the necessary requirements for those reports be considered along with the implementation of the wizard. At this time, however, the requirements for those reports are not included in this document.