

APPROACHES TO MITIGATING  
THE EFFECTS OF STAFF  
TURNOVER ON THE  
CWA 303(d) PROGRAM

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EXAMPLES FROM PRACTICE



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## I. Introduction

Staff turnover can disrupt the flow of work and even delay progress toward achieving programmatic goals. In addition to the time commonly required to get a new staff person familiar enough with the job to do it well, the turnover can result in the loss of critical institutional knowledge and experience as well as the loss of professional connections that are key to collaboration with other programs and stakeholders. State, Tribal, and Territorial water quality programs have developed a wide variety of policies and practices to mitigate these adverse effects of staff turnover. This brief report categorizes and summarizes some of those approaches. Most of the information included here originated from registration responses of State and Territorial CWA 303(d) program staff and Tribal water quality program staff [hereinafter “program staff”] for, and presentations during, the *2022 National Training Workshop on Water Quality Data, Assessment, and Plans*, an event convened by ELI through a cooperative agreement with the EPA. Follow-up conversations by ELI staff supplement those materials.

This report explores helpful **Document Creation, Maintenance, and Organization** practices; ways of using **Digital Infrastructure** to support easier file access and transfer as well as collaboration with colleagues; strategies for efficient, effective, and **Deliberate Integration** of new staff into the program; and **Staff Trainings** for quick but thorough education about the program and role responsibilities.

The information provided here is not intended to be comprehensive. It is meant to facilitate communication among water quality programs, especially CWA 303(d) programs; help generate new ideas; and ultimately improve programmatic continuity and resilience. With lessons learned from many recent retirements as well as the pandemic, and while there still is significant movement in program staff, this is an opportune time to prepare for future turnover.

## II. Document Creation, Maintenance, and Organization

A common and important means of mitigating the effects of staff turnover is documentation. Program staff highlighted the value of curated and up-to-date program documents as well as materials assembled for the purpose of transitions. They also emphasized the need to organize the information in a way that is easily accessible to other staff.

### *Existing Program Documents*

Many program staff emphasized the value of keeping good records and organizing documents well to support staff transitions. Records can provide insight into previous engagements, decisions, and activities that shape present role responsibilities and workplans. In Maryland, for example, new staff are encouraged to review administrative records to aid their understanding of what information will be important to document in their own projects. Some program staff noted that access to records can help new staff continue engagement efforts. In Colorado, for instance, new staff receive information on stakeholder outreach history. That information also is shared at every public meeting to account for potential staff turnover among stakeholder organizations. Also, documentation does not need to be in written form. Staff in Colorado note that recording virtual stakeholder meetings is an easy way to capture the discussion, and new staff find the recordings to be extremely useful when getting up to speed.

Numerous program staff noted the importance of making documentation of policies and practices available to new staff, to clarify the *why* and *how*. Examples of documents that programs use for this purpose include:

- **Listing methodologies and assessment rationales.** In Colorado, Missouri, New Mexico, and Pennsylvania, new staff are provided information on listing methodologies and assessment rationales. In Pennsylvania, staff can easily reference the different assessment methodologies on the Department of Environmental Protection’s [Assessment Methodology webpage](#).
- **TMDL templates.** In Colorado, Maryland, and Washington, TMDL templates help convey procedural starting points, required elements, and development checklists (Box 1). [Washington’s TMDL Template](#) provides instructions, outlines each section, and offers draft language for consideration. Similarly, as demonstrated by its [table of contents](#), Montana’s TMDL Handbook contains detailed procedural guidance and analysis methods that are not project specific.
- **Management Plans.** In New Mexico, new staff are directed to the Water Quality Management Plans, which summarize the State’s water quality management system and the roles of the major participants in that system. In Kansas, the Quality Management Plans give a broad overview of the roles and responsibilities of the Bureau of Water CWA programs, providing new staff an understanding of what, how, and why they do what they do.
- **Quality Assurance Project Plans.** Staff of Hawaii, the Citizen Potawatomi Nation, and the Snoqualmie Tribe highlighted the value of detailed Quality Assurance Project Plans (QAPPs) to teach new staff about a project’s documentation and reporting requirements, timeline, data quality objectives, and sampling procedures. In Hawaii, for example, staff utilize QAPPs for [beach monitoring](#) and [stream monitoring](#), as well as an [overarching QAPP](#) that includes appendices and attachments for different protocols and Standard Operating Procedures.

### Box 1. TMDL Template

Figure 1 is an example of a TMDL template table of contents in Colorado. The template outlines all elements of a TMDL in chronological order.

TMDL Template TOC

1. Introduction
  - a. Water Quality Impairments and TMDLs
  - b. Document Structure
2. Standards & Impairments
  - a. Segments
  - b. Use Classifications
  - c. Pollutants of Concern
  - d. Numeric and Narrative Criteria
  - e. Impairments
  - f. TMDL Targets and Goals
3. Watershed Characterization
  - a. Project Setting
  - b. Land Use and Land Cover
  - c. Geology and Soils
  - d. Climate
  - e. Hydrology
  - f. Water Quality
  - g. Community Profile
4. Source Assessment
  - a. Technical Approach
  - b. Point Sources
  - c. Nonpoint Sources
  - d. Subwatershed 1
  - e. Subwatershed 2
  - f. Subwatershed 3
  - g. Subwatershed 4
5. TMDLs and Allocations
  - a. Methodology
  - b. Allocations
  - c. Critical Conditions
  - d. TMDLs and Reductions
6. Reasonable Assurance
7. Public Participation
  - a. Public Notice Process
  - b. Appeals Process
8. Water Quality Improvement Strategy
  - a. Implementation Goals and Indicators
  - b. Recommended Actions for NPS
  - c. Point Sources
  - d. Monitoring
9. References

Figure 1. TMDL Template TOC in Colorado

- **Standard Operating Procedures.** Program staff of many jurisdictions, including Arkansas, Colorado, Hawaii, Illinois, Maine, Maryland, Massachusetts, New Mexico, Montana, and New York, cited Standard Operating Procedures (SOPs) as valuable means of communicating regular aspects and tasks associated with different programs. SOPs can include information on business practices, step-by-step directions, helpful resources, and repetitive tasks. For example, Arkansas has a SOP for [wadeable stream sampling protocols](#) and Hawaii has SOPs for [beach monitoring](#), [near shore coastal chemistry monitoring](#), and [field equipment usage](#), amongst other tasks. In Illinois, SOPs were developed to provide brief overviews of National Pollutant Discharge Elimination System (NPDES) permits and how they relate to TMDLs, with explanations of how to read and work in conjunction with NPDES permits for the purposes of TMDL implementation. Massachusetts staff referred to SOPs as a key means of maintaining program continuity. Some program staff stressed that, to maximize their utility, SOPs should be regularly reviewed and updated.
- **Program-specific procedures and information.** Staff of Alaska, Michigan, and Ohio document certain program procedures, and staff of the Morongo Band of Mission Indians developed a basic program schedule (a chart providing rough timelines for when tasks need to be accomplished), all of which were identified as helpful in the course of staffing transitions. In Illinois, new staff receive organizational charts and lists of the relevant people involved with TMDL development, both internally at the Illinois EPA and externally at the U.S. EPA. These documents help identify who is responsible for water quality data management, water quality monitoring and assessment, permit review—including NPDES Permit compliance history—as well as other relevant information needed from stakeholders over the course of the TMDL development process.
- **Position responsibilities and expectations.** Some program staff highlighted more position- and project-specific documents as useful during staff transitions. In Colorado, Kansas, and Missouri, there are documents that include information on position responsibilities and expectations, and work plans in Maine explain the goals and objectives of specific projects.

### *Succession-Specific Documents*

While the aforementioned types of documents can be a fundamental resource for new staff, some jurisdictions have gone much further, developing materials specifically for staff transitions or a particular transition. In Maine, [Succession Planning Guidance](#) required all permanent Water Bureau staff to prepare transition items over a nine-month period, including monthly task lists, contact information of relevant partners, work plans, internal and external reports, policy memos, QAPPs/SOPs, and electronic and paper records and where to find them. The materials are to be reviewed annually to keep them up to date. In Colorado and New Mexico, departing staff are required to prepare transition memos that document deadlines, file locations, and current project work. In Wyoming, departing staff develop unique transition plans specific to a position and context. In Virginia, departing staff are interviewed prior to their departure to develop knowledge transfer plans, documentation, and/or job aides to help on-board their successors.

### Centralized Onboarding

Several program staff noted that the documents and other information being assembled or even created for staff turnover are only part of the story; how the material is organized and shared also is very important for facilitating learning. Some jurisdictions centralize onboarding materials so that they can be easily found and repeatedly accessed. In Colorado, new staff receive a Google Drive folder populated with guidance documents, useful websites, an organizational chart, and file structures. Staff of the Morongo Band of Mission Indians use a table of contents with lists of all department SOPs, hyperlinks to file locations, and regular program tasks (Box 2). Staff of the Fond du Lac Band of Lake Superior Chippewa developed an internal section handbook with information on where to find information, how to learn about the division, and important data sources. Centralized onboarding also can go beyond information delivery to include action items. In New Mexico, new staff receive a standard onboarding checklist that includes a transition memo, guidance documents, listing methodologies and assessment rationales, and required and recommended trainings.

### III. Digital Infrastructure

Multiple program staff emphasized the usefulness of digital platforms for organizing and making accessible documents and other information important to staffing transitions, as well as simplifying collaboration, tracking tasks, and generally making it easier for new staff to enter an ongoing project. Staff of New Mexico, for example, use shared networks on State servers to store program materials and guidance. For the Fond du Lac Band of Lake Superior Chippewa and the Morongo Band of Mission Indians, staff use cloud-based systems, such as Google Drive, Dropbox, and Microsoft SharePoint, for reporting and sharing data within departments.

#### Box 2. SOP Table of Contents

Figure 2 is an example of a Morongo Band of Mission Indians table of contents listing all department SOPs, with hyperlinks to file locations.

SOP#	Version	SOP Name	Prepared By	Release Date	Revised By	Revision Date	Reviewed By	Reviewed Date
<b>TWP - Tribal Water Program</b>								
<b>TWP 1 Water Quality Monitoring</b>								
1.1.1	2	Troll 9500 Quick	JT	01/03/08	KM	04/14/14		
1.1.2	1	Troll 9500 Full Calibration	KM	04/14/14				
1.1.3	1	SmartROLL Quick	KM	10/19/15				
1.1.4	1	SmartROLL Full Calibration	KM	07/21/15				
-- Pre-Sampling Checklist								
1.2.1	2	Troll 9500 Surface Water	JT	04/04/07	KM	07/06/21	JS	07/08/21
1.2.2	4	Low Flow Cell	LR	10/27/10	KM	08/04/17		
1.2.3	1.2	SmartROLL Surface Water	KM	10/30/15	KM	07/06/21	JS	07/08/21
1.2.4	1	T-100 Turbidimeter Calibration and Operation	KM	10/29/15				
1.3.1	2	Rugged Reader	LR	09/27/10	KM	12/18/13		
1.3.2	2	Transferring Rugged Reader Data to Desktop	LR	03/16/11	KM	10/29/13		
1.4	2.1	Laboratory Sampling	JT	04/04/07	KM	07/06/21	JS	07/08/21
1.5	3	Measuring Stream Flow	KM	06/04/14	KM	07/06/21		
1.5.1	2.1	Measuring Stream Flow	KM	07/06/21				
1.5.2	1	Measuring Stream Flow	KM	06/29/20			JS	08/11/20
-- Surface Water Flow Data								
1.6	3	Solution Inventory and	JT	10/13/08	KM	07/06/21	JS	07/08/21
<b>TWP 2 Data Management and Reporting</b>								
2.1	1.2	Field Sheets	KM	07/21/15	KM	02/16/17		
2.2	1	Field Activities Review	KM	04/14/14				
2.3	1	WQX Template	KM	03/21/14				
2.4	3	WQX Web	LR	02/22/12	KM	10/29/15		
2.5	1	Annual WQAR for EPA	KM	11/13/14				
2.6	1	Laboratory QA/QC	KM	06/06/16			JS	06/07/16
2.7	1	Importing Data Into	KM	06/12/20			JS	09/21/20
2.8	1	Reviewing Data from the	KM	12/28/18			JS	03/01/19
<b>TWP 3 Compliance Assistance</b>								
3.1	2.1	Army Corps of Engineers			KM	01/23/20		
3.2	1	NPDES Construction	KM	10/22/14				
<b>TWP 4 Nonpoint Source Management</b>								
4.1	1	Operating the Water Pump	LR	07/08/10				
4.2	1	Hydroseeding	KM	01/16/15				
4.3	1	Pilotmaster Range Seeder	JM	04/14/08				
4.4.1	2	Dew Drop Drill Operation	LR	01/16/09	KM	06/10/15		
4.4.2	1	Dew Drop Drill Remote	LR	07/06/09				
4.5	1	Soil Sampling	LR	04/02/09				
4.6	1	Motion Sensor Camera and	JM	07/14/08				
4.7	1	Silt Fencing	LR	01/15/10				
4.8	2	Trough Monitoring	LR	04/02/09	KM	07/20/17		
4.9	2	Bull Thistle Removal	LR	10/08/09	KM	08/04/14	JC	09/02/14
4.10.1	1	Mistletoe Removal	KM	06/10/15				
4.10.2	1	Mistletoe Monitoring	KM	12/17/15				
4.11	1	Gold Spotted Oak Borer	KM	10/13/14				

Figure 2. SOP table of contents by the Morongo Band of Mission Indians

In some cases, digital infrastructure goes beyond storage and sharing to include workflows. Missouri and New Mexico staff use Trello, a web-based workflow platform designed for collaboration and task tracking. Staff from Missouri noted that the platform provides stepwise direction and a visual display of tasks in the TMDL process from development to submission for EPA review and action. New Mexico staff explained that they created templates in Trello for Surface Water Quality Bureau tasks, and then they customize those templates for each project, adding that the templates are a critical tool when training new staff and for informing existing staff where a project left off when a staff person leaves (Box 3). In addition to Trello, some digital workflow platforms suggested by program staff include Microsoft Lists, Microsoft Teams Planner, and Monday.com. New Mexico staff noted that they are transitioning to the Microsoft Teams tasks tool for CWA 303(d) task tracking.

**Box 3. Trello and New Mexico’s 303(d) Program**

New Mexico staff utilize Trello to create templates for their Integrated Reports and TMDLs. The templates are customized for each project to include deadlines, tasks, and files. During staff turnover, templates can be used to train new staff or inform remaining staff of a project status.

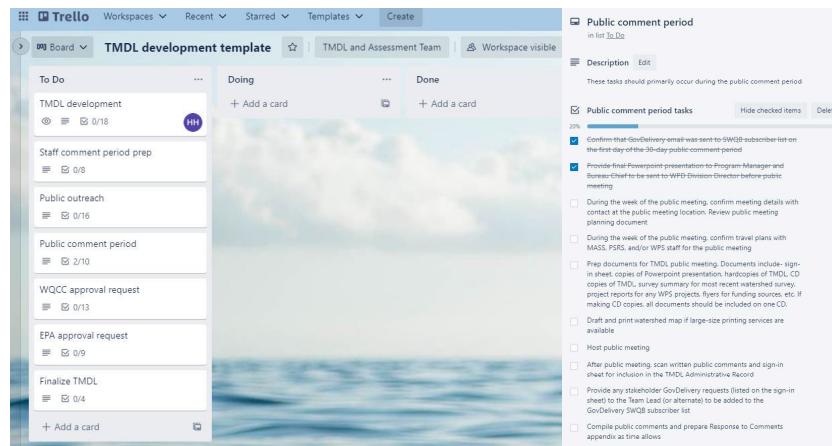


Figure 3. Example of New Mexico's TMDL Development Template on Trello

#### IV. Deliberate Integration

Program staff identified a variety of ways that they have more efficiently and effectively integrated new staff into the program, the agency, and the broader community working on these issues. Their experiences reveal how this intentional integration equips new staff with tools, relationships, and information helpful to fulfilling their responsibilities, thereby reducing project delays common with staff turnover and setting up the new staff to succeed.

##### *Building a Sense of Place*

Several program staff noted their efforts to include new staff in a variety of meetings and otherwise orient them to a new position. In Colorado, for example, new staff often are invited to public meetings as a way to learn about the program’s Water Quality Control Division. In Utah and Vermont and for the Morongo Band of Mission Indians, weekly meetings promote team building. In addition, some program staff noted efforts to train new staff on larger operational contexts as well as program history and objectives. In Utah, new staff are introduced to larger program structures with explanations of how their role fits into the Clean Water Act, other sections, divisions, and the department. Similarly, staff from the Commonwealth of the Northern Mariana Islands focus on creating a holistic understanding of the Clean Water Act for new staff.

In Maine, facilitated conversations with new staff during the onboarding process are used to explain a program's history, mission, and goals, and in California, individual conversations with different staff provide various perspectives to inform a new staff's understanding of the role.

### *Mentorship*

Many program staff highlighted the importance of mentorship in integrating new staff to the program, better enabling the new staff to develop a practical understanding of the role and its relation to others, as informed by the learned experience of senior staff. In jurisdictions such as Alaska, American Samoa, California, Maryland, and Nebraska, the mentorship is informal, without defined methods and timelines. In other jurisdictions, mentorship is more structured; for example, in Illinois, new staff are paired with senior staff to guide them through the CWA 303(d) Program requirements, and, in North Dakota, the Leadership Development Program facilitates organized succession planning and cross-program training.

### *Introductions*

Several program staff emphasized the value of introducing new staff to relevant partners, an effective means of maintaining knowledge networks and promoting collaborative efforts. In Utah, for example, new staff are introduced to the director and staff of the Division of Water Quality, staff of other departments, the EPA Regional Coordinator, and other State partners. Similarly, new staff with the Morongo Band of Mission Indians are introduced to relevant figures in other Southern California Tribes, since coordination and information sharing is key for Tribes utilizing similar grants. Experiences like these have shown that internal and external introductions provide new staff greater clarity on how their roles are situated relative to others and quickly establish a network of people that can provide support.

### *Partnerships*

A few program staff referenced the importance of engaging new staff in existing partnerships to maintain program continuity, noting that program knowledge often is contained in those collaborative networks. For example, staff of the Citizen Potawatomi Nation and Morongo Band of Mission Indians attend recurring intertribal meetings to foster continued dialogue and information-sharing. Staff of other Tribes emphasized their agency partnerships, including the Red Lake Band of Chippewa Indians with EPA Region 5 and the Susanville Indian Rancheria with various agencies. The Montana Watershed Coordination Council was highlighted for cultivating relationships between Federal, State, and local agencies as well as watershed groups and other nonprofit organizations involved in data collection, planning, and implementation.

## **V. Staff Trainings**

Program staff also emphasized the importance of trainings for providing new staff the information and skills necessary to fulfill their responsibilities, with the added benefits of promoting the uniformity of work processes and encouraging knowledge sharing across departments. The types of trainings relied on by States, Tribes, and Territories are varied, with those different types having different benefits.



### *External Trainings*

External trainings provide States, Tribes, and Territories the opportunity to educate new and existing staff without having to dedicate the time or resources needed to develop similar trainings themselves. These trainings have been offered by the EPA, from the CWA 303(d) Program and other programs; other agencies; and non-governmental entities (in collaboration with the EPA) such as the Association of Clean Water Administrators (ACWA) and ELI. In many jurisdictions, including Arkansas, Colorado, Florida, Guam, Hawaii, Iowa, Kansas, New Mexico, and South Dakota, new staff are either required or urged to participate in EPA trainings on water resource management and the Clean Water Act (some of which are available [HERE](#)). Program staff referenced both self-paced trainings, which enable staff to focus on areas of particular relevance to their roles at their own speed, and more traditional group trainings, whether in person or virtual, which offer a collaborative learning environment. Identified self-paced trainings include EPA's Water Quality Standards Academy Online Courses and the Watershed Academy. Identified group trainings include EPA's Water Quality Standards Classroom Academy, ACWA's *Clean Water Cross-Program Workshops and Modeling Workshops*, and ELI's *National Training Workshops on Water Quality Data, Assessment, and Plans*. Program staff also highlighted various webinars, including EPA's [TMDL Foundations course](#); Watershed Academy Webcast Seminars; and webinars hosted by ACWA, NEIWPCC, and ELI.

Some external trainings are designed for specific audiences, such as those tailored to staff from Tribes. For example, EPA-Tribal workshops function to meet Tribe-specific needs. Staff of the Grand Traverse Band of Ottawa and Chippewa Indians noted that aspects of these workshops have been helpful in understanding program structures. Other trainings seek to improve specific skillsets, such as data management and reporting in the [Assessment, Total Maximum Daily Load \(TMDL\) Tracking and Implementation System](#) (ATTAINS). Several program staff highlighted the various ATTAINS trainings that the EPA has developed, including modules on assessments, reports, and administration, as well as the ATTAINS Tribal Pilot Program.

### *Internal Trainings*

While external trainings can save States, Tribes, and Territories time and money, internal trainings can be important for educating new staff on the details of the jurisdiction's specific procedures and programs. In Utah and Virginia, for example, trainings on the States' broader program environments, including information on division missions, organization, common program elements, and Federal laws, are provided. In some jurisdictions, including Arkansas, Colorado, and the Commonwealth of Northern Mariana Islands, trainings are held for new staff on assessment methodologies and sampling procedures. In Georgia, the Water Quality Standards Coordinator prepares presentations on water quality standards and the Clean Water Act, specifically to teach management-level staff. Internal trainings can assume different forms, such as pre-recorded videos (Arizona) and one-on-one sessions (Hawaii), and they may be required (Arizona) or delivered on an ad hoc, voluntary basis (Illinois). Staff of Pennsylvania utilize a web-based approach to develop and deliver internal trainings: the [Pennsylvania Clean Water Academy](#) provides new staff with training on Clean Water Act topics including water quality standards and how to use the State's Integrated Report tools. Additional modules are in development for sample collection, with an ability to track a user's progress for quality assurance purposes. Arkansas staff also have developed a digital platform, called myARLearning, which guides new staff through several program documents via learning modules, quizzes, and videos.

### *Applied Learning*

Numerous program staff identified ways in which their States, Tribes, and Territories use applied learning in transitions, with new staff gaining hands-on experience by working alongside existing staff. In Colorado, for example, new staff conduct discrete tasks to assist existing staff with TMDL development. Staff of Colorado noted that this approach teaches new staff about all TMDLs in development and ensures that those individuals are equipped to support the team with a future staff transition. In Utah, departing staff work with new staff to prepare workplans, review materials, and discuss file maintenance. In other jurisdictions, such as Alaska, California, the Elk Valley Rancheria, Guam, and the Santee Sioux Nation, applied learning occurs informally, with new staff becoming familiar with their roles through practice with existing staff, but without structured requirements or timelines.

### *Cross Trainings*

Trainings of staff in different departments or programs on the roles and responsibilities of other departments or programs can be valuable to new staff but also helpful in mitigating the effects of turnover when delivered to existing staff. Program staff noted that this cross training ensures that multiple staff are familiar with any particular program, so, when one staff member leaves a role, someone on staff still has basic knowledge of the primary tasks and work plans of that role. Cross training can be particularly helpful for promoting program continuity in jurisdictions where there might be only one staff person assigned to a particular program. For the Morongo Band of Mission Indians, for example, trainings occur across programs so at least two people in each department know the primary tasks of a program. Similarly, new staff of the Commonwealth of the Northern Mariana Islands attend interoffice training on water quality assessment methods and sampling procedures. In Hawaii, cross-programmatic participation occurs between water quality standards, monitoring, listing, and TMDL staff. In Colorado, many positions are structured to create redundancy, so multiple people have job knowledge for a particular role. For example, every Colorado TMDL has more than one writer, so if a TMDL's lead author leaves, remaining staff are not forced to rely solely on documentation.

## VI. Conclusion

States, Tribes, and Territories have developed a broad array of policies and practices to mitigate the adverse effects of staff turnover. In most instances, a collection of these approaches is used rather than reliance on a single strategy. That experience suggests that the approaches should be viewed as complementary and deployed as appropriate for the situation. Program staff emphasized the importance of involving management and as many permanent staff as possible in these efforts to ensure long-term program continuity. It can be, and perhaps should be, a team effort.

While this report focuses on ways of approaching and managing staff turnover, some of the strategies can help reduce staff turnover as well. Structures and approaches for supporting staff, from making them feel welcome and comfortable to preparing them at the outset of their jobs and throughout their tenures to succeed in their work and advance in their careers, can be valuable for the purposes of retention. Arguably the best approach to staff turnover is to minimize the instances of it, to the extent possible.