Whatcom Clean Water Program Report
January 1-June 30, 2016

This report summarizes Whatcom Clean Water Program partner work to identify and correct fecal coliform bacteria pollution during the first six months of 2016. Priority areas for fecal coliform bacteria pollution reduction include the geographic areas that drain to the lower Nooksack River and to Drayton Harbor.

Water sampling location information and laboratory results are available from Whatcom County's water quality monitoring results webpage at http://www.whatcomcounty.us/2170/Water-Quality-Monitoring-Results. The webpage contains:

- Links to interactive maps with water sampling site locations and laboratory analysis results
- Link to results summaries and graphs indicating status and trends
- The opportunity to enter an address in the "find my home" box on the interactive map displaying preliminary results from routine monitoring efforts; see where nearby samples are taken and view results

THREE YEARS of DATA

Based on the last three years of Whatcom County Public Works data, over 80 percent of routinely monitored locations in the **Nooksack River/Portage Bay** and the **Drayton Harbor** watersheds fail to meet the bacteria water quality standard[1] established to protect peoples' health. At the end of June 2016:

*….. 16% of the routine water monitoring sites in the **Nooksack River/Portage Bay** watershed meet the state water quality bacteria standard established to protect peoples' health.*

*….. 19% of the routine water monitoring sites in the **Drayton Harbor watershed** meet the state water quality bacteria standard established to protect peoples' health.*

ONE YEAR TREND SHOWS IMPROVEMENT

Since 2013, Whatcom Clean Water Program partners have worked with County residents to put in place practices to prevent bacteria pollution related to animal manure and human sewage. The City of Lynden is working to identify and address bacteria sources from its stormwater system. During the past year at many routinely monitored locations in the **Nooksack River/Portage Bay** and the **Drayton Harbor** watersheds, data shows a downward trend of fecal coliform bacteria.

*….. For 11 of 19 routine monitoring sites in the **Nooksack River/Portage Bay watershed** that do not meet either part of the state water quality bacteria standard for three years of data, lower fecal coliform levels have been measured during the last 12 months….*

*….. For 11 of 31 routine monitoring sites in the **Drayton Harbor watershed** that do not meet either part of the state water quality bacteria standard for three years of data, lower fecal coliform levels have been measured during the last 12 months…...*

Figure 3 (page 2) and Figure 6 (page 3) are bar charts comparing three-year and 12-month geometric mean data for routine monitoring sites in the Nooksack River/Portage Bay and Drayton Harbor watersheds. See Whatcom County's water quality results webpage for summaries that are updated monthly:

- Nooksack River watershed: http://www.whatcomcounty.us/DocumentCenter/View/20844
- Drayton Harbor watershed: http://www.whatcomcounty.us/DocumentCenter/View/20833

[1] Washington State's bacteria surface water quality standard has two criteria—a geometric mean criterion and a 90th percentile criterion. Both criteria must be met for water quality to meet the standard. Freshwater designated uses and criteria are explained further in Washington Administrative Code (WAC) 173-201A-200.

NOOKSACK RIVER/PORTAGE BAY WATERSHED

The Nooksack River and its tributaries are the main source of freshwater flowing to Portage Bay (see Figure 1). Portage Bay's water quality is impacted by bacteria pollution that flows downstream and empties into the bay. Bacteria loading from the Nooksack River has contributed to seasonal shellfish harvest restrictions in a significant portion of the Portage Bay shellfish growing area (see Figure 2).

The area outlined in red indicates the **Lower Nooksack River watershed** which flows to Portage Bay; this area is included in fecal coliform pollution reduction efforts

Portage Bay—Lummi Nation shellfish growing area. See Figure 2 for enlargement indicating classification of the commercial shellfish growing area.

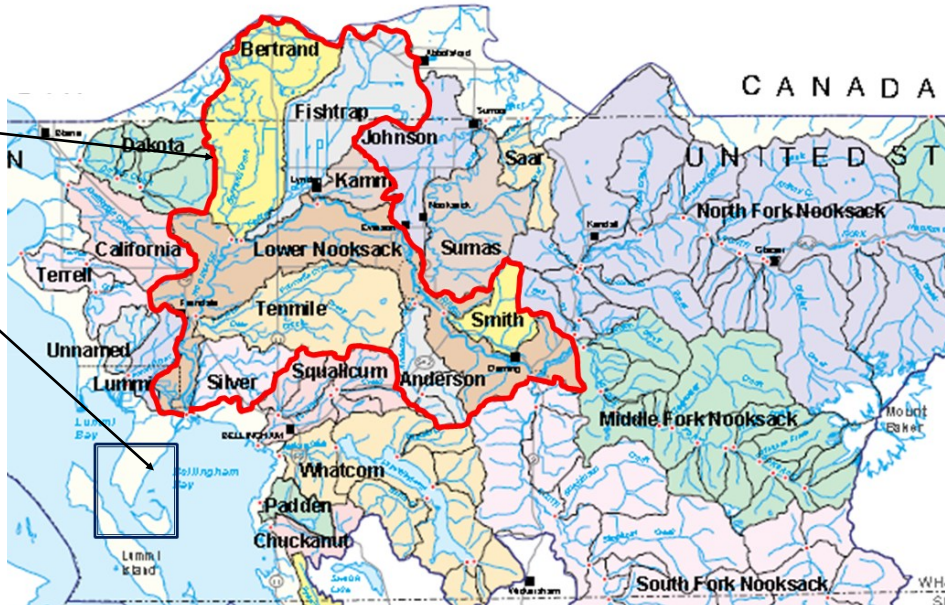

Figure 1—Map outlining land area that drains to the lower Nooksack River (downstream of North, Middle and South forks of the Nooksack River) and eventually to the marine water of Portage Bay

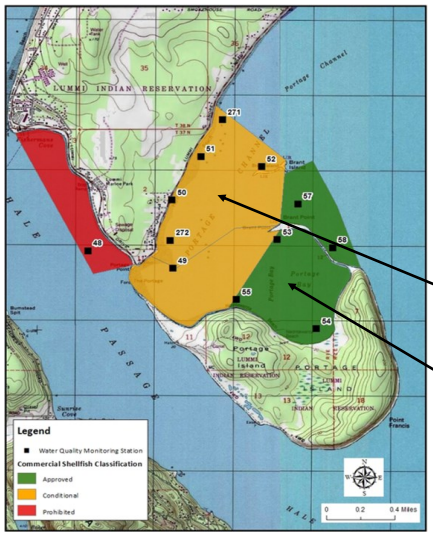

Figure 2—Enlargement of Portage Bay shellfish growing area

The orange area is Conditionally Approved shellfish growing area; shellfish harvest is prohibited in 800 acres during months of April—June and October—December annually.

The green area is shellfish growing acreage classified as Approved for harvest.

The bars in Figure 3 illustrate the geometric mean result for three years of Whatcom County Public Works data for each routine monitoring location in the Lower Nooksack River watershed. The colored bars average sampling results over the past three years; the black diamond associated with each bar represents the average of results for that monitoring location over the past twelve months.

A diamond below the top of a colored bar indicates lower bacteria levels over the past year. For more analysis, maps and descriptions of the routine monitoring locations, please see http://www.whatcomcounty.us/2170/Water-Quality-Monitoring-Results.

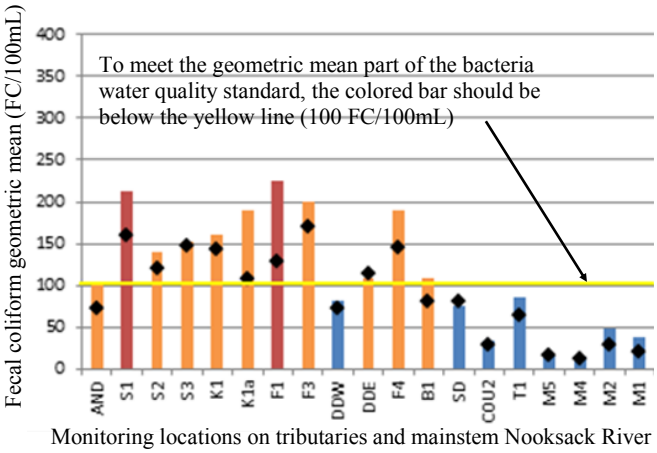

Figure 3— Bar chart showing geometric mean for fecal coliform monitoring data from July 2013—July 2016 for routine monitoring locations in Lower Nooksack/Portage Bay watershed

DRAYTON HARBOR

Dakota Creek and California Creek are the two primary sources of freshwater that drain to Drayton Harbor - (see Figure 4). Flow studies have shown that Drayton Harbor's water quality and the commercial shellfish growing area are impacted by bacteria pollution flowing downstream from these creeks into the bay.

Maps and sampling results from multiple agencies are available at http://www.whatcomcounty.us/2170/Water-Quality-Monitoring-Results.

Drayton Harbor shellfish growing area. See Figure 5 for enlargement indicating classification of the commercial shellfish growing area.

Dakota Creek

California Creek

Drayton Harbor watershed shown in brown color indicates the land area draining to Drayton Harbor

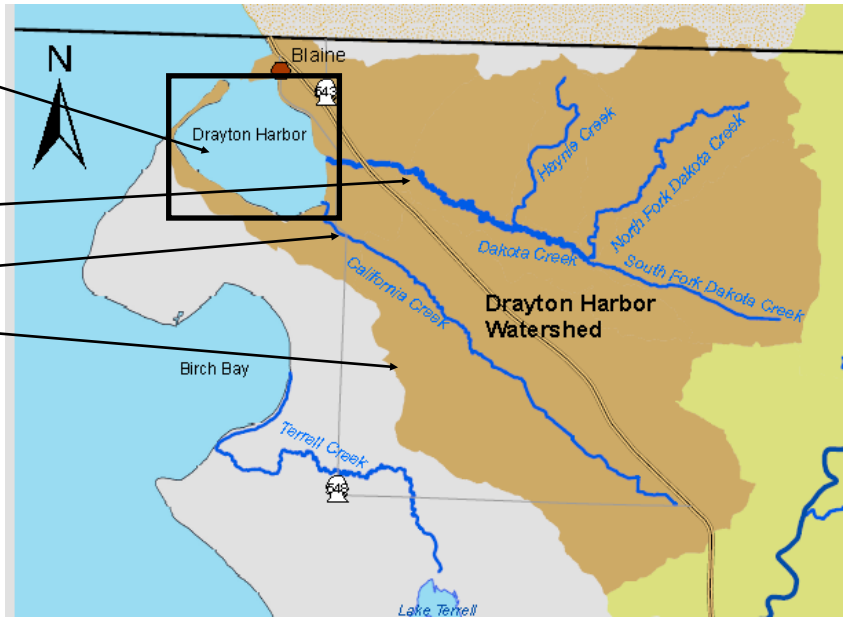

Figure 4 — Map indicating land area that drains to the marine water of Drayton Harbor

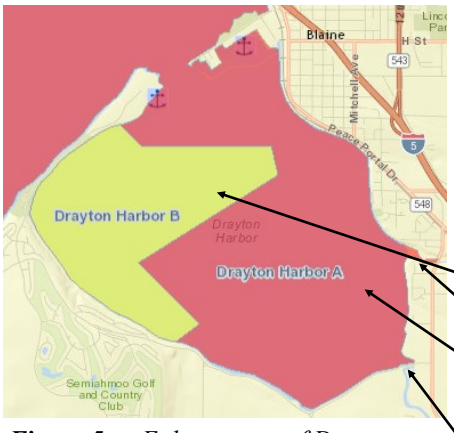

Figure 5 — Enlargement of Drayton Harbor commercial shellfish growing area

Yellow area is Conditionally Approved shellfish growing area with harvest prohibited annually from November 1 through January 31.

Dakota Creek

Red area is classified as Prohibited — Commercial shellfish harvest is not allowed from Prohibited areas. Find out more about shellfish growing area classifications at http://www.doh.wa.gov/CommunityandEnvironment/Shellfish/GrowingAreas

California Creek

The bars in Figure 6 illustrate the geometric mean result for three years of Whatcom County Public Works data for each routine monitoring location in the Drayton Harbor watershed. The colored bars average sampling results over the past three years; the black diamond associated with each bar represents the average of results for that location over the past twelve months.

A diamond below the top of a colored bar indicates lower bacteria levels over the past year. For more analysis, maps and descriptions of the routine monitoring locations, please see http://www.whatcomcounty.us/2170/Water-Quality-Monitoring-Results.

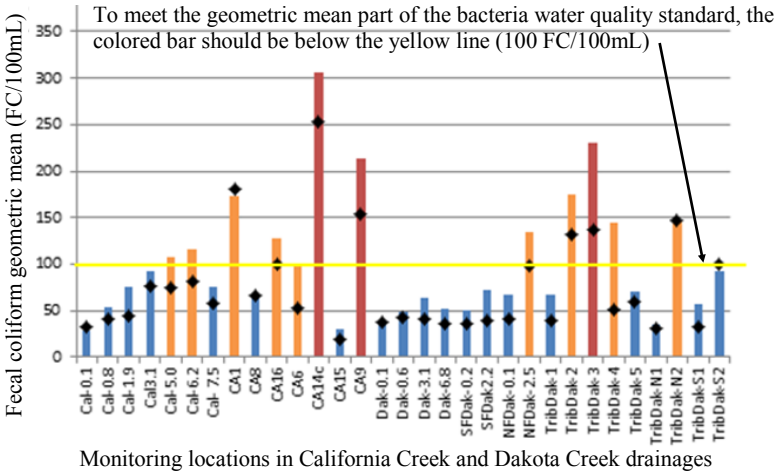

Figure 6 — Bar chart showing geometric mean for fecal coliform monitoring data from July 2013—July 2016 for routine monitoring locations in Drayton Harbor watershed

FOCUS ON REDUCING FECAL COLIFORM BACTERIA POLLUTION

Preventable sources of fecal coliform bacteria pollution

Within Whatcom County, residents and businesses are responsible for managing approximately 87,000 cows, 2000 horses, hundreds of other farm animals such as pigs, goats, and sheep, thousands of chickens, 37,000 dogs, and 28,000 septic systems. Cities are responsible for managing sewer systems and wastewater treatment plants according to permit requirements to prevent pollution.

Over a thousand linear miles of rivers, streams, creeks, ditches, and seasonal drainage swales in Whatcom County present multiple opportunities for animal waste and human sewage to enter waterways if residents, businesses and municipalities do not properly manage preventable pollution sources.

Methods used to find and correct fecal pollution sources include fecal coliform sampling, data analysis and field observations. Staff communicate data and observations to residents and encourage landowner action in correcting identified pollution sources. Correcting these preventable sources presents the opportunity for improving water quality and protecting public health. Regulatory agencies can take enforcement action when necessary, but prefer to work with residents through cooperative assistance and incentives to achieve the necessary pollution prevention.

BACTERIA POLLUTION REDUCTION WORK

Monitoring and assessment

Fecal coliform sampling in marine water: Washington State Department of Health monitors and classifies marine waters to manage safe shellfish harvesting.

Fecal coliform sampling in freshwater: Throughout the freshwater of the Nooksack River and Drayton Harbor watersheds, Whatcom County Public Works (Public Works), Washington State Department of Agriculture Dairy Nutrient Management Program (DNMP), Washington State Department of Ecology (Ecology), Nooksack Indian Tribe Natural Resources, Lummi Nation Natural Resources, and Whatcom Conservation District staff coordinate fecal coliform monitoring. Cities and groups such as the Tenmile Clean Water Project also collect monthly fecal coliform sampling data.

DNMP, Ecology, and Public Works staff conduct source identification sampling at various locations in prioritized areas where pollution levels are high and where staff are focusing pollution reduction efforts. Source identification sampling is often conducted during or shortly after rain events.

Staff post county-wide fecal coliform sampling results to publically available on-line maps:

- Webpage compiling links to routine sampling and source identification sampling results, maps and summaries: http://www.whatcomcounty.us/2170/Water-Quality-Monitoring-Results#wq summaries.
- Information about pollution reduction work in geographic focus areas is available at: http://www.whatcomcounty.us/2178/2015-16-Focus-Areas.

Airplane survey: In March 2016, DNMP and Ecology staff flew in a small plane over parts of Whatcom County to assess land conditions and management practices.

Land use mapping: During the first half of 2016, DNMP staff mapped about 350 new acres of berry fields in the Fishtrap Creek watershed focus area. About 87 acres appeared to have manure solids applied as mulch. Agency staff are working to ensure farm operators are aware of best management practices (BMPs) to protect water quality and to inform producers that help is available to learn about, install and maintain BMPs.

Property outreach

Contacting residents to correct preventable pollution from manure and human sewage: Included in the Whatcom Clean Water Program is Whatcom County's Pollution Identification and Correction (PIC) program. Whatcom County Public Works leads the local PIC program in focus areas with the highest fecal coliform bacteria pollution levels (see http://www.whatcomcounty.us/2178/2015-16-Focus-Areas).

During the first half of 2016, Public Works continued PIC program work within the Drayton Harbor watershed (Lower Dakota, Brown Malloy and Loomis Trail drainages) and in the Fishtrap Creek drainage within the Nooksack River watershed.

In PIC program focus areas, Public Works and Whatcom Conservation District (WCD) staff contact properties with farm animals and offer help to evaluate potential manure-related pollution sources and explore voluntary measures to fix them. Outside of PIC program focus areas, Ecology staff contact non-dairy agricultural properties regarding water pollution concerns related to animal manure. Ecology staff may work with residents to recommend ways to correct pollution sources or residents may voluntarily seek help from WCD to develop solutions.

If a landowner chooses not to participate in a cooperative PIC approach to correcting identified preventable pollution sources, Public Works may refer a property to a regulatory agency - either Whatcom County Planning & Development Services, Washington State Department of Ecology (Ecology), or Washington State Department of Agriculture Dairy Nutrient Management Program (DNMP) - for potential enforcement follow up.

If an improperly functioning onsite sewage system (OSS) is suspected of contributing bacteria pollution, agencies coordinate with Whatcom County Health Department for follow up. Throughout Whatcom County, County Health maintains oversight of the OSS operation and maintenance (O&M) program.

DNMP staff perform routine inspections of dairy facilities throughout Whatcom County and maintain regulatory oversight for licensed cow dairies related to water quality protection.

Results

PIC PROGRAM and WCD FARM PLANNING

NOOKSACK RIVER WATERSHED

- WCD assisted 29 landowners with property evaluation
  - ◊ 2 PIC program cooperators
  - ◊ 9 referrals from Whatcom County Planning & Community Development Services (PDS)
  - ◊ 15 referrals from Ecology
  - ◊ 3 walk-in customers

- WCD helped landowners complete 10 farm plans
  - ◊ 12 BMPs installed/implemented
    - ∗ 1 irrigation management
    - ∗ 1 manure storage
    - ∗ 1 vegetated treatment area
    - ∗ 1 underground outlet
    - ∗ 3 pasture management plans
    - ∗ 2 livestock access control
    - ∗ 2 heavy use area protection
    - ∗ 1 decommissioning of underground outlet

DRAYTON HARBOR WATERSHED

- In the North Fork Dakota Creek focus area, WCD assisted 7 landowners with property evaluation
  - ◊ 5 PIC program cooperators
  - ◊ 2 referrals from PDS
- In other ongoing focus area drainages, WCD assisted 16 landowners with property evaluations
  - ◊ 9 PIC program cooperators
  - ◊ 7 referrals from PDS

- WCD helped landowners complete 8 farm plans
  - ◊ 11 BMPs installed/implemented
    - ∗ 4 improved manure storage areas
    - ∗ 1 livestock exclusion fencing
    - ∗ 1 prescribed grazing plan
    - ∗ 4 livestock access control
    - ∗ 1 heavy use area protection

ECOLOGY

NOOKSACK RIVER WATERSHED, DRAYTON HARBOR WATERSHED, SUMAS WATERSHED

Ecology inspectors confirmed implementation of 42 livestock best management practices on 27 properties through site visits, roadside observation or confirmation by landowner. Ongoing work included:

Bertrand Creek subwatershed:

3 non-commercial farm properties contacted: properties include beef cows and horses

Pollution sources identified

- Horses with direct access to ditch and surrounding saturated area
- Confinement area adjacent to roadside ditch and heavy use area draining to stream

Best management practices completed or committed to

- Use temporary fencing to seasonally exclude horses from lower, wet pasture and ditch

Scott Ditch subwatershed

2 properties contacted; 1 heifer facility and 1 non-commercial beef cow property

Pollution sources identified

- Drain tile discharging to roadside ditch with sample confirming high fecal coliform concentration
- Extended animal access to wet area draining to roadside ditch

Best management practices completed or committed to

- Cap pipe and remove manure from portion of field contributing to contaminated discharge
- Seasonal livestock exclusion fencing
- Develop and follow farm plan with help from Whatcom Conservation District

***Figure** 7 — January through June 2016 Ecology property contact summary*

	Initial Property Contact	Follow-Up Property Contact	Warning letter
Nooksack River/Portage Bay watershed sub-basins			
Bertrand Creek	2	1	1
Scott Ditch	1	1	0
Kamm Creek	1	3	0
Tenmile Creek	7	0	1
Silver Creek	7	0	1
Anderson Creek	13	3	2
total	**31**	**8**	**5**
Drayton Harbor watershed sub-basins			
Dakota Creek	0	0	0
California Creek	1	2	1
total	**1**	**2**	**1**

Warning letter

- 1 warning letter issued; resident responded with plan to cap pipe and remove manure pile

Kamm Creek subwatershed:

4 property contacts, initial and follow-up (1 non-commercial horse-keeping, 1 heifer operation; 1 horse-boarding operation)

Pollution sources identified

- Damaged lagoon subject to flooding unsuitable to receive manure-contaminated waste
- Confinement area discharging to catch basin piped to roadside ditch
- Confinement area and overgrazed pasture drain to roadside ditch

Best management practices completed or committed to

- Discontinue using lagoon to receive contaminated waste; alternative storage identified
- Exclude animals from field adjacent catch basin during rainy season until improvements made
- Construct heavy use area protection

Tenmile Creek subwatershed:

7 properties contacted; 6 horse-keeping properties and 1 goat dairy

Pollution sources identified

- Extended animal access to seasonal streams in saturated pastures
- Manured confinement areas draining to ditch and stream
- Large, uncontained manure piles allowed to drain to surface water

Best management practices completed or committed to

- Seasonally exclude animals from low, wet areas with flowing water
- Develop farm plan with help from Whatcom Conservation District

Warning letter

- 1 warning letter issued; resident responded with plan to prevent pollution

Silver Creek subwatershed:

7 non-commercial/hobby farms contacted; properties include sheep, beef cows, horses:

Pollution sources identified

- Manure-contaminated discharges from confinement areas and manure piles allowed to enter streams
- Extended animal access to saturated fields with seasonally flowing drainage swales and ditches

Best management practices completed or committed to

- Seasonally exclude animals from field portion with flowing water; to begin in fall before rainy season
- Manure pile removed
- Develop farm plan with help from Whatcom Conservation District

Warning letter

- 1 warning letter issued to property owner who did not respond to opportunity to communicate plans to correct identified pollution sources; ECY will follow up by September 30

Anderson Creek subwatershed:

14 livestock properties contacted: 9 non-commercial/hobby farms; 5 commercial operations; properties include sheep, poultry, beef cows, heifers, horses, goats

Pollution sources identified

- Manure-contaminated discharge from confinement areas allowed to enter ditches and creek
- Confinement area drainage piped to roadside ditch
- Extended access to saturated pastures flowing to creek
- Contaminated discharge from drain tile entering ditch
- Field application of manure prior to rain event; manure application without adequate setback resulting in pollution discharge to ditch

Best management practices completed or committed to:

- Relocate animals away from area near creek prior to rainy season
- Seasonal fencing and pasture management
- Manure storage and confinement area improvements to prevent contaminated runoff
- Remove pipe
- Develop and implement farm plan guidance for proper manure application

Warning letter

- 2 warning letters issued resulting in both residents communicating plan for management changes to prevent manure-contaminated pollution to water

California Creek sub-watershed

3 properties contacted (2 follow-up visit to beef cow properties and 1 contact with horse property)

Pollution sources identified

- Confinement area discharges to stream
- Uncontained manure piles placed where allowed to drain to stream

Best management practices completed or committed to

- Exclude cows from area sloping to stream during wet season
- Temporary cover in place for manure pile; plan in place for covered manure storage structure

Warning letter

- 1 warning letter issued; resident responded with plan to prevent pollution

Sumas watershed

Regulatory enforcement

- 1 penalty issued to commercial berry property for November 2015 manure-contaminated discharge; penalty paid and pollution prevention plan submitted in compliance with Administrative Order

WSDA Dairy Nutrient Management Program (DNMP)

NOOKSACK RIVER WATERSHED, DRAYTON HARBOR WATERSHED, BIRCH BAY WATERSHED, SUMAS RIVER WATERSHED

DNMP staff completed 17 routine inspections of dairy facilities in Whatcom County during the first six months of 2016. Additionally, staff conducted 14 follow up inspections and 22 investigations regarding water quality concerns related to dairy operations. See Figure 8 on page 9 for a summary; in Figure 8 a facility is counted once, even if subject to multiple visits during a single month. At the end of June 2016, DNMP noted five enforcement actions remain outstanding (either under investigation or pending).

DNMP enforcement summary

Warning Letters - water quality concerns noted:

Nooksack River/Portage Bay watershed

- Concerns with lagoon management and lack of containment of drainage from feeding area

Drayton Harbor watershed

- Inadequate nutrient management record keeping

Sumas River watershed

- Concern with lagoon management and ground applications of solid and liquid manure outside of plan guidance

Notices of Correction – water quality concerns noted:

Nooksack River/Portage Bay watershed

- Inadequate nutrient management record keeping

Drayton Harbor watershed

- Inadequate vegetated treatment area; pollution discharge from tile drain; improper land application of manure

Birch Bay watershed

- Improper land application of manure, inadequate nutrient management record keeping, concern with contaminated runoff from calf hutch area

Sumas River watershed

- Improper land application of manure, inadequate nutrient management record keeping

Pending - (under investigation)

Nooksack River/Portage Bay watershed—6 total

- Application and subsequent flood in Scott Ditch sub-basin, facility concerns in Fishtrap sub-basin, and concern with discharge from tile drain outlet in Tenmile sub-basin

Sumas River watershed

- Pollution discharge related to facilities management error, improper ground application of manure, and discharge from facility

Figure 8 *— January through Jun 2016 Dairy Nutrient Management Program property contact summary*

2016 January –June	Routine Inspections	Follow-Up Inspections	Investigations	Referred to Whatcom CD	Warning Letter	Notice of Correction	Penalties	Pollution discharges confirmed
Nooksack River watershed								
Bertrand	2	3	2	2	1	0	0	0
Fishtrap	4	3	4	2	2	1	0	1
Scott	2	0	1	1	0	0	0	0
Wiser/Cougar	1	0	0	0	0	0	0	0
Tenmile	3	1	2	2	0	0	0	1
total	**12**	**7**	**9**	**7**	**3**	**1**	**0**	**1**
Drayton Harbor watershed								
Dakota	0	1	0	0	0	0	0	0
California	0	2	3	1	1	2	0	1
total	**0**	**3**	**3**	**1**	**1**	**2**	**0**	**1**
Birch Bay and Sumas River watershed								
total	**5**	**4**	**10**	**6**	**3**	**5**	**0**	**4**

Whatcom County Health Department
NOOKSACK RIVER WATERSHED summary

Whatcom County Health Department administers Whatcom County's On-site Sewage System (OSS) operation & maintenance (O&M) program and has regulatory oversight for all OSS in Whatcom County.

Whatcom County designated Portage Bay as a marine recovery area in mid-2015. Since August 2015, County Health has notified homeowners in the Lynden North area (Bertrand, Fishtrap and Kamm Creek drainages) and in the Tenmile Creek and Scott Ditch drainages about OSS O&M requirements.

To help with educating landowners about how their OSS functions and how to evaluate their systems, County Health sponsored eight homeowner training workshops attended by 235 OSS owners. An additional 220 property owners completed an online homeowner OSS training.

When a licensed specialist performs an OSS evaluation, the specialist submits a report of system status (ROSS) to County Health. Homeowners performing their own OSS evaluations submit a homeowner report of system status (HROSS).

Through April 2016 after a nine month period of OSS evaluation requirement notification and enforcement in the Lynden North area, County Health received a total of 948 system status reports (out of 985 required system evaluations). Almost half (45%) of the evaluations were performed by homeowners (HROSS).
Initial outcomes indicated 90 percent of OSS evaluations were satisfactory, 9 percent of systems (84 OSS) needed maintenance and one percent (8 OSS) were found to be failing.

County Health staff conducted verifications on 172 (or 40 percent) of the HROSS submitted to County Health from the Lynden North area. While County Health found most HROSS verifications acceptable, County Health staff found 20 evaluations with errors, 10 evaluations falsely reporting evaluations that had not been performed, and 14 failing OSS.

Of the total 22 failing systems found in the Lynden North area, 13 had leaking or overflowing septic tanks, 8 systems had sewage surfacing on the ground and one system was found to be a pipe directly discharging untreated sewage to surface water.

Through June 2016, County Health also sent O&M notifications to approximately 2000 OSS owners in the Scott Ditch and Tenmile Creek drainages.

Figure 9 summarizes O&M activity during April through June 2016 in the Tenmile Creek and Scott Ditch drainages.

Figure 9 *— Whatcom County Health Department summary of on-site sewage system operation and maintenance work April –June 2016 for Tenmile Creek and Scott Ditch drainages*

Nooksack River/Portage Bay watershed	Tenmile Creek	Scott Ditch
O&M* letters sent	1762	152
O&M evaluations reported (ROSS** submittals)	752	113
ROSS failure	6	1 (tank)
ROSS maintenance needed	102	7
HROSS*** submitted	271	45
HROSS staff audits	31	32
HROSS failure	0	0
OSS repairs	3	1

*O&M = operation & maintenance
**ROSS = Report of System Status (submitted by O&M service provider)
***HROSS = Homeowner Report of System Status (submitted by OSS owner)