



**GROWING AREA ED  
Isle au Haut**

**Sanitary Survey Report**

**Report Date: 02-28-2013**

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**APPROVAL**

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## Executive Summary

This is a Sanitary Survey report for Isle au Haut an island in Knox County written in compliance with the requirements of the 2009 Model Ordinance and the National Shellfish Sanitation Program. No changes in classification are needed at this time. There were no new pollution sources found no new stations were added or deactivated and water quality has remained consistent. The next sanitary survey is due in 2024 and the next Triennial in 2015.

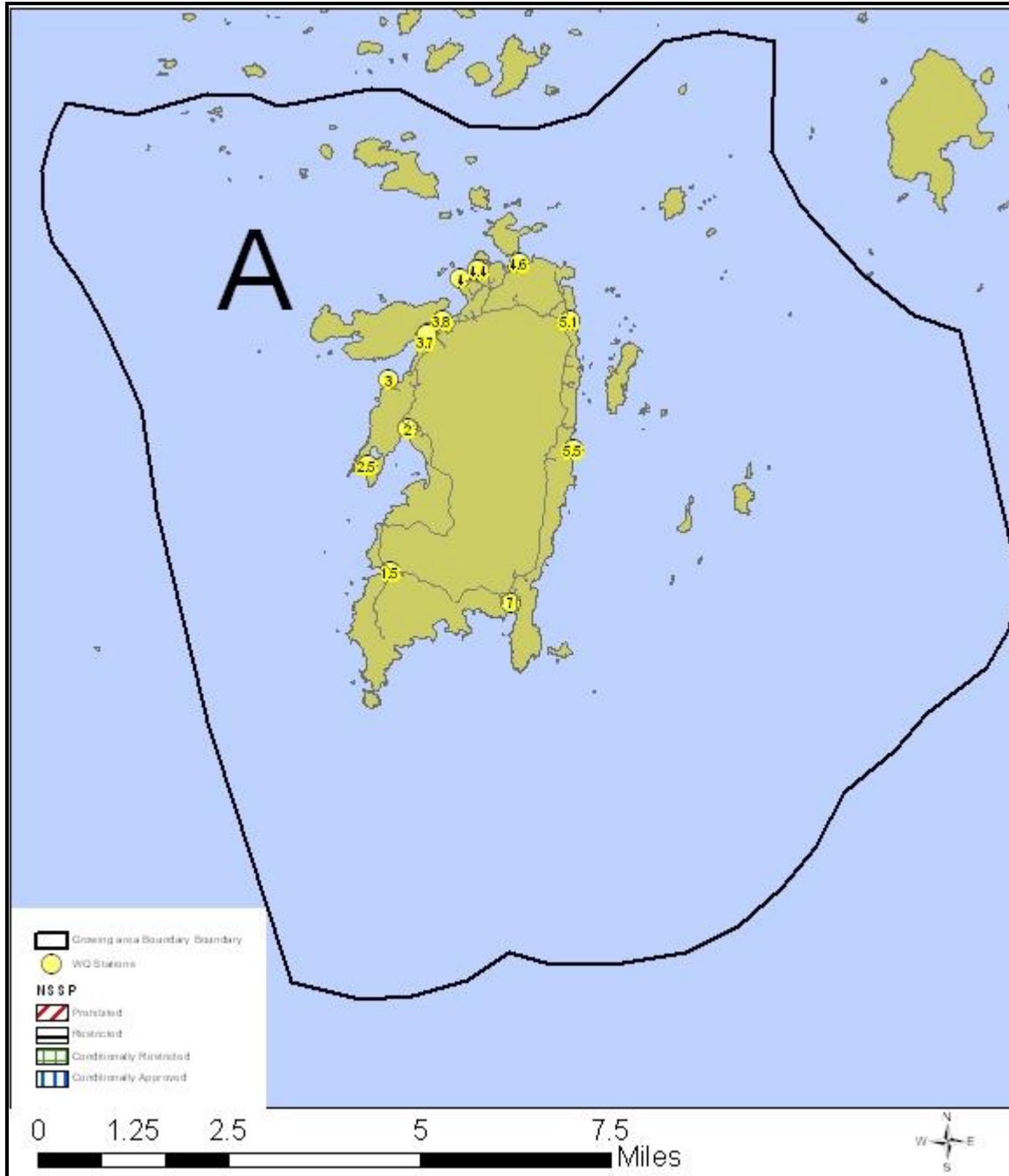
Isle au Haut is a large (6 miles x 3 miles; 5500 acres) offshore island south of the Hancock County fishing village of Stonington, Maine. Winter population is <80 people, while summer resident numbers average +\-300 individuals. Land use is limited to small farms, seasonal structures and near-shore fishing. Isle au Haut is reached by private ferry/barge service and most of the roads are town owned. Acadia National Park occupies the southern 1/2 of the island (2860 acres) and the use is limited to a small number of visitors per day with the largest use in the summer months. There are no licensed overboard discharges (OBD's), sewage treatment plants, or other pollution sources located in this growing area and at this time the entire growing area is classified approved. There were no new stations added or no stations deactivated during this review period.

Shellfish Growing Area ED includes all of the shores and flats of Isle au Haut. A few of the larger islands in the vicinity are also considered in this shellfish growing area. They include: Kimball Island, York Island and Burnt Island the eastern and southern shores of the island are almost exclusively bold cliffs and cobble beaches with offshore half-tide ledges. Water depths off the cliffs range from 20 to 90 feet. The subtidal bottoms in the shallower areas are populated with sand dollars (*Mellita testudinata*) and sea urchins (*S. droebachiensis*). Harbor seals are evident in great numbers in June. Bird life includes gulls, ducks, osprey and puffins. Great numbers of rafted ducks are seen in the fall.

The largest, shallow coves are Head Harbor, Duck Cove and Moores Harbor. Intertidal and subtidal areas have sand with areas of grass and seaweed. Head Harbor has a large population of soft shell clams (*Mya arenaria*), surf clams (*Spisula solidissima*) and evidence of razor clam shells (*Ensis directus*). Duck Harbor has soft shell clams, blue mussels (*Mytilus edulis*), razor clams and sand dollars. Blue mussels are the most common shellfish in Moores Harbor.



Figure 1 Growing Area ED, with Active Water Stations





### History of Growing Area Classification

January 30, 2004 Pollution area 30F was promulgated do to presence of malfunctioning septic system.

May 18, 2005 Pollution area 30F was repealed because of repaired septic system.

#### Current Classification(s)

At the end of the 2012 review year, shellfish growing area ED had areas classified as:

**Approved:** 12 stations: ED 1.5, 2, 2.5, 3, 3.7, 3.8, 4, 4.4, 4.6, 5.1, 5.5 and 7

#### Activity during Review Period

**2001:** Added; ED 2.5 (Seal Trap), 3.7 (Twn Dock), 3.8 (NUN 6), 4.4 (Laundry Cove), and 4.6 (Barter Creek)

**2004:** A shoreline survey was conducted in the immediate vicinity and inland of ED4.4 where elevated scores were noticed, no pollution source identified in area. During the survey at ED4.4 some island caretakers expressed concern about a system at a seasonal residence ED43 in the north end of the Thorofare. Survey samples and a call to the homeowner confirmed that there is a problem with the system at this property. A certified site evaluator has completed the soils evaluation. The site is to be cleared this winter and the goal is to have the new IG in place and working by July 1, 2004 when the owners return for the summer season. Work on system should begin spring 04 when materials can be barged over from mainland. A closure has been produced until the septic can be replaced and is online.

**2005:** On May 11, 2005 a known failing septic system identified in 2004 was visited by Department personnel. The system was found to have been repaired and that information along with the clean water quality history of the adjacent WQ station ED 4 the closure was repealed on May 18, 2005. Two stations ED 3.5 and 5 were deactivated.

**2009:** The southern half of the island is owned by Acadia National Park service. The park service maintains 5 campsite shelters and 3 composting toilets in the Duck Harbor area. The composting toilets are all set well back from the shore and are within ¼ mile of the landing. These sites and facilities are lightly used during the summer months and do not constitute a threat to nearby water quality. Water quality station ED 1.5 is located right at the landing maintained by Acadia Park to access this area and has a current P90 score of 2.9. The area immediately near the landing is inspected every year during random boat runs to check the status and functionality of the 3 composting toilets located in this area. They were inspected on the boat run that occurred on July 13, 2009 by DMR staff. No problems were noted.

**2010:** The area immediately near the landing is inspected every year during random boat runs to check the status and functionality of the 3 composting toilets located in this area. They were inspected on the boat run that occurred on August 10, 2010 by DMR. No problems were found.



**2011:** During 2011 drive through surveys by boat were conducted on 4/25, 5/18, 6/15, 7/19, 8/24 and 9/26. No new pollution sources were identified.

### **Pollution Sources Survey**

The following sections include information on pollution sources which do or may impact water quality in growing area ED. Pollution sources that are reviewed in this section include domestic waste, including both private inground systems and over board discharges (OBDs), marinas and mooring fields, stormwater and pollution from non-point sources (streams), farms and other agricultural activities, domestic animals and wildlife areas, and recreational areas.

#### **Domestic Waste (*IG Systems*)**

The largest concentrations of dwellings are along the Isle au Haut Thorofare. Sixty (60) structures were inspected on the shore of Isle au Haut. Most had in ground septic systems (IGS) with no problems identified. Many of the buildings were summer homes and occupied June through August (population summer-375, winter-70). During the 2012 Sanitary survey 97 properties were identified as having either an in ground septic or outhouse. Of these 97 properties none were found to be an issue.

#### **Marinas and Mooring Fields**

There are moorings off the town/mail boat dock in the Isle au Haut Thorofare and private pleasure boat moorings in several of the coves around the islands. There are no marina operations in the area. Two town-owned wharfs on the Thorofare provide docking for the daily mail boat runs along with fuel. There are no pump out facilities commercial or private on Isle au Haut. The majority of boats are commercial fishing vessels that re not used to live aboard and do not have heads or marine toilets. In the summer there is a small number of transient boats that do moor in some of the coves during the summer months but water quality sampling data in these coves during the summer months shows no impact.

#### **Stormwater**

Stormwater runoff is generated when precipitation from rain and snowmelt events flows over land or impervious surfaces and does not percolate into the ground. As the runoff flows over the land or impervious surfaces (paved streets, parking lots, and building rooftops), it accumulates debris, chemicals, sediment or other pollutants that could adversely affect water quality if the runoff is discharged untreated (US EPA 2009). Thus, stormwater pollution is caused by the daily activities of people within the watershed. Currently, polluted stormwater is the largest source of water quality problems in the United States.

The primary method to control stormwater discharges is the use of best management practices (BMPs). In addition, most major stormwater discharges are considered point sources and



require coverage under an NPDES permit. In 1990, under authority of the Clean Water Act, the U.S. EPA promulgated Phase I of its stormwater management program, requiring permitting through the National Pollution Discharge Elimination System (NPDES). The Phase I program covered three categories of discharges: (1) "medium" and "large" Municipal Separate Storm Sewer Systems (MS4s) generally serving populations over 100,000, (2) construction activity disturbing 5 acres of land or greater and (3) ten categories of industrial activity. In 1999, US EPA issued Phase II of the stormwater management program, expanding the Phase I program to include all urbanized areas and smaller construction sites.

Although it is a federal program, in the state of Maine, the Phase II Stormwater permit is issued and regulated by the Maine DEP (Chapter 500 and 502). Under the MS4 regulations, each municipality must implement the following six Minimum Control Measures: (1) Public education and outreach, (2) Public participation, (3) Illicit discharge detection and elimination, (4) Construction site storm water runoff control, (5) Post-construction stormwater management, and (6) Pollution prevention/good housekeeping. The permit required each city or town to develop a draft Stormwater Management Plan by September 3, 2003 that will establish measurable goals for each of the Minimum Control Measures. The Town must document the implementation of the Plan, and provide annual reports to the Maine DEP. Currently the discharge of stormwater from 28 Maine municipalities is regulated under the Phase II permit requirements, however, no municipalities located within the boundaries of growing area ED fall under these regulations. Additionally, the Maine Stormwater Management Law provides stormwater standards for projects located in organized areas that include one acre of more of disturbed area (Maine DEP 2009).

### **Non-Point Pollution Sources** (*streams, etc*)

All the streams of any significance in this growing area have water quality stations located near their mouths. Random sampling of these stations has never indicated any problems.

### **Agricultural Activities**

There are no large scale agricultural activities on the island. There are some small scale places with chickens, goats and horses but these locations do not impact the receiving waters.

### **Domestic Animals and Wildlife Activity**

The shores have normal populations of upland game, waterfowl and deer. Large numbers of sea birds are noted in the fall and spring as this area is on the migration flyway. Seals, whales and large fish populations are found in the surrounding waters. No impact to surrounding water quality has been detected.

### **Conservation/Recreation Areas** (*beaches, trails, etc.*)

The southern half of the island is owned by Acadia National Park service. The park service maintains 5 campsite shelters and 3 composting toilets in the Duck Harbor area. The



composting toilets are all set well back from the shore and are within ¼ mile of the landing. These sites and facilities are lightly used during the summer months and do not constitute a threat to nearby water quality. Water quality station ED 1.5 is located right at the landing maintained by Acadia Park to access this area and has a current P90 score of 2.9. The area immediately near the landing is inspected every year during random boat runs to check the status and functionality of the 3 composting toilets located in this area. They are inspected on yearly on scheduled boat runs by DMR staff. No problems were noted.

### Hydrographic and Meteorological Assessment

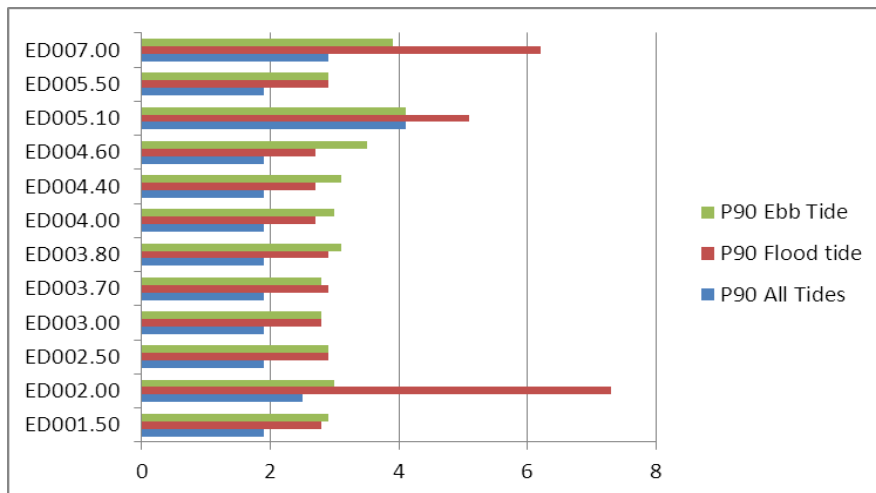
The NSSP program requires, as part of the sanitary survey, the evaluation of hydrographic and meteorological factors in order to determine the factors that may affect distribution and persistence of pollutants throughout the growing area (ED). Climate and weather can affect the distribution of pollutants or can be the cause of pollutant delivery to a growing area. Prevailing winds can determine the distribution of pollutants in a growing area. Rainfall patterns and intensity can affect water quality through pollutant delivery in runoff or cause flooding which can affect the volume and duration of pollutant delivery. Examples of hydrographic factors that are evaluated in this report are tidal transport, and rainfall.

#### Tides

Coastal Maine experiences a mixed, semi-diurnal tide, with diurnal inequalities that are more pronounced on spring tides. National Oceanic and Atmospheric Administration data for station at Stonington, Maine indicate a mean tidal range of over 10 ft. Currents in the area are predominantly driven by the tides. All along the coast of Maine, the tide flows generally to the north and east and ebbs to the south and west. Weather conditions effect tidal ranges and current speeds, sometimes very strongly.

In order to explore the effect of tide on water quality in growing area ED, samples collected at flood and ebb tides were analyzed and are presented in the chart below. Only stations with 30 samples are presented.

**Figure 2 Area ED P90 most recent 30 vs. Tide stage**







As seen in the chart above there were some stations that exhibited higher P90's on the flood (ED 7, 5.1, 3.7 and 2) and some stations showed an increase on the ebb (ED 4.6, 4.4, 4, and 3.8). However even with these differences every station has a P90 of less than 7. With this in mind I would say that tide does seem to affect certain stations for unknown reasons but the impact is slight and does not affect the overall water quality in this area.

**Rainfall**

In order to investigate how water quality is impacted by rainfall events which do not necessitate an emergency flood closure, a rainfall assessment for all stations in growing area ED was completed. For this assessment, all data for 2000-2012 was placed in an Excel pivot table that compares fecal coliform score to rainfall amount over a 72 hour period. The 72 hour period includes any rainfall that fell on the day of collection along with the previous two days before collection. All individual scores that exceed 14 fc/100ml have been highlighted. The data was broken down into two different tables one showing rainfall < .5 and the other for rainfall > .5". There have been 12 incidents over the last 12 years where area ED scores exceeded 14 fc/100ml. Of those 12 scores 7 occurred on June 18, 2001. No explanation can account for the high scores recorded this day. Only 3 stations ED 2, 5.1, and 7 have had scores > 14 on multiple occasions with each station having two such scores over the last 12 years. This is demonstrated in table 3 below. Based on the following rain data it is concluded that rainfall amounts do not adversely affect area ED.

**Table 1 Area ED Rain Amount vs. FC/100 72 Hour rain total <.5 2000-2012**

Row Labels	0	0.02	0.03	0.04	0.15	0.15	0.19	0.2	0.24	0.27	0.3	0.32	0.35	0.47
ED001.50	3.6	2.9	2.9	2.9	2.9	1.9	2.9	2.9	3.6	1.9	2.9	1.9	1.9	2.9
ED002.00	5.4	3.6	2.9	2.9	2.9	2	9.1	2.9	2.9	1.9	2.9	1.9	1.9	2.9
ED002.50	3.6	2.9	2.9	2.9	2.9	1.9	2.9	2.9	2.9	1.9	2.9	1.9	1.9	
ED003.00	2.9	2.9	2.9	2.9	2.9	2	2.9	2.9	2.9	1.9	2.9	1.9	1.9	2.9
ED003.70	3.6	2.9	2.9	2.9	2.9	1.9	2.9	2.9	2.9	1.9	2.9	1.9	1.9	2.9
ED003.80	4	2.9	2.9	2.9	2.9	1.9	2.9	2.9	2.9	1.9	2.9	1.9	1.9	
ED004.00	2.9	2.9	2.9	2.9	2.9	1.9	2.9	2.9	2.9	1.9	3.6	1.9	1.9	2.9
ED004.40	9.1	2.9	2.9	1.9	2.9	1.9	3.6	2.9	2.9	1.9	2.9	1.9	1.9	2.9
ED004.60	3	2.9	2.9	2.9	2.9	1.9	2.9	2.9	2.9	1.9	2.9	1.9	1.9	
ED005.10	2.9	2.9	2.9	3.6	2.9	1.9	2.9	2.9	2.9	1.9	2.9	1.9	2	2.9
ED005.50	3.6	2.9	2.9	2.9	2.9	1.9	2.9	2.9		1.9	2.9	1.9	1.9	2.9
ED007.00	75	2.9	2.9	2.9	9.1	4	2.9	2.9	2.9	1.9	2.9	1.9	1.9	2.9



**Table 2 Area ED Rain Amount vs. FC/100ml 72 Hour rain total >.5 2000-2012**

	0.5	0.56	0.6	0.61	0.62	0.65	0.75	0.8	0.86	0.88	1.1	1.12	1.13	1.48	1.5	1.7	2	2.1	2.46
ED001.50	2.9	2.9	1.9	1.9	2.9	2	2.9	2.9	2.9	2.9	1.9	2.9	2.9	1.9	1.9	150	2.9	2.9	2.9
ED002.00	2.9	3.6	1.9	1.9	2.9	2	2.9	2.9	2.9	93	1.9	2.9	2.9	1.9	1.9	75	2.9	2.9	3.6
ED002.50	2.9	2.9	1.9	1.9	2.9	1.9	1.9	2.9		2.9	2	2.9	2.9	1.9	1.9	23	3.6	2.9	2.9
ED003.00	2.9	2.9	1.9	1.9	2.9	1.9	2.9	2.9	2.9	2.9	1.9	2.9	2.9	1.9	1.9	93	2.9	2.9	2.9
ED003.70	2.9	2.9	1.9	1.9	2.9	1.9	2	2.9		2.9	1.9	2.9	2.9	1.9	1.9	3.6	2.9	2.9	2.9
ED003.80	3.6	2.9	1.9	1.9	2.9	1.9	1.9	2.9		3.6	2	2.9	2.9	1.9	1.9	9.1	2.9	2.9	2.9
ED004.00	2.9	2.9	1.9	1.9	2.9	1.9	2.9	2.9	2.9	2.9	1.9	2.9	2.9	1.9	1.9	150	2.9	2.9	2.9
ED004.40	2.9	2.9	1.9	1.9	2.9	1.9	1.9	2.9		2.9	1.9	2.9	2.9	1.9	1.9	1100	2.9	2.9	2.9
ED004.60	7.3	2.9	1.9	1.9	2.9	1.9	1.9	2.9		2.9	1.9	2.9	2.9	1.9	1.9	2.9	3.6	2.9	2.9
ED005.10	2.9	2.9	10	1.9	2.9	18	1.9	2.9	2.9	2.9	1.9	2.9	2.9	1.9	1.9	3.6	2.9	23	2.9
ED005.50	2.9	2.9	1.9	1.9	2.9	1.9	2.9	3.6	2.9	2.9	1.9	2.9	2.9	1.9	1.9	93	2.9	2.9	2.9
ED007.00	2.9	3.6	1.9	1.9	14	2	2.9	2.9	2.9	2.9	1.9	2.9	3	1.9	2	9.1	2.9	43	2.9

**Table 3 Area ED all scores > 14 FC/100ml 2000-2012**

Station	Date	Tide	Sal	Score	Rain0Hrs	Rain24Hrs	Rain48Hrs
ED001.50	18-Jun-01	LE	21	150	0	1.7	0
ED002.00	18-Jun-01	LE	30	75	0	1.7	0
ED002.00	25-Jul-05	H	29	93	0.4	0	0.48
ED002.50	18-Jun-01	E	30	23	0	1.7	0
ED003.00	18-Jun-01	E	30	93	0	1.7	0
ED004.00	18-Jun-01	E	28	150	0	1.7	0
ED004.40	18-Jun-01	E	26	1100	0	1.7	0
ED005.10	23-Aug-04	HF	23	23	0	1.14	0.96
ED005.10	26-Sep-11	E	31	18	0	0.04	0.61
ED005.50	18-Jun-01	L	30	93	0	1.7	0
ED007.00	31-Jul-00	HE	32	75	0	0	0
ED007.00	23-Aug-04	F	15	43	0	1.14	0.96

**Winds**

Prevailing winds are out of the southwest in the summer months and the north during the winter. As Isle au Haut is an offshore island any wind influence would be with open ocean water and should have no effect on fecal coliform levels.

**River Discharges**



There are no rivers discharging into this area. Minimal fresh water influence occurs via small streams flowing into the salt water. Flow from these creeks is minimal and is probably subject to seasonal variance and some effect from rainfall. Drainage areas are primarily undeveloped forest and wetland. The only large body of fresh water on Isle au Haut is Long Pond, on the southeast tip of the island. Long Pond's outlet runs through a wetland and into the ocean at Sheep Thief Gulch (Water quality sample station ED 6).

**Water Quality Review**

Table 4 lists all active stations in Growing Area ED, with their respective Geomean and P90 calculations for 2012. Please refer to Appendix A for a key to interpreting the headers on the columns of Table 4. The approved and restricted standards for each station are also displayed in Table 6.

All approved stations, met their NSSP classification standard in 2012.

**Table 4 Area ED P90 most recent 30 samples**

Station	Class	Count	MFCCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std
ED001.50	A	30	30	1.9	0	2	1.9	31	163
ED002.00	A	30	30	1.9	0.08	5.4	2.5	31	163
ED002.50	A	30	30	1.9	0	1.9	1.9	31	163
ED003.00	A	30	30	1.9	0	2	1.9	31	163
ED003.70	A	30	30	1.9	0	2	1.9	31	163
ED003.80	A	30	30	1.9	0	2	1.9	31	163
ED004.00	A	30	30	1.9	0	2	1.9	31	163
ED004.40	A	30	30	1.9	0	1.9	1.9	31	163
ED004.60	A	30	30	1.9	0	1.9	1.9	31	163
ED005.10	A	30	30	2.1	0.21	18	4.1	31	163
ED005.50	A	30	30	1.9	0	2	1.9	31	163
ED007.00	A	30	26	2.1	0.13	8	3.2	32	176

**Table 5 2012 Sample Count Area ED**

Station	Class	Random	Total	Comment
		Open		
ED001.50	A	6	6	
ED002.00	A	6	6	
ED002.50	A	6	6	
ED003.00	A	6	6	
ED003.70	A	6	6	
ED003.80	A	6	6	
ED004.00	A	6	6	



Station	Class	Random	Total	Comment
		Open		
ED004.40	A	6	6	
ED004.60	A	6	6	
ED005.10	A	6	6	
ED005.50	A	6	6	
ED007.00	A	6	6	

**Water Quality Discussion and Classification Determination**

As evidenced by this table water quality in area ED is very clean with 10 out of the 12 stations having geomeans of 1.9. Table 5 below shows our sampling effort for the 2012 sampling season. All stations were collected the required amount of times as mandated by the NSSP random sampling method.

No classification changes were made to growing area ED in 2012.

**Recommendation for Future Work**

As this area is all open and approved with no known pollution sources there are no recommendations for any future work.



### Appendix XXX. Key to Water Quality Table Headers

Station = water quality monitoring station

Class = classification assigned to the station; prohibited (P), restricted (R), conditionally restricted (CR), conditionally approved (CA) and approved (A).

Count = the number of samples evaluated for classification, must be a minimum of 30.

MFCNT = the number of samples evaluated with the MTec method (included in the total Count column)

Geo\_Mean = means the antilog (base 10) of the arithmetic mean of the sample result logarithm (base 10).

SDV = standard deviation

Max = maximum score of the 30 data points in the count column

P90 = 90<sup>th</sup> percentile

APPD\_STD = the 90<sup>th</sup> percentile, at or below which the station would meet approved criteria in the absence of pollution sources or poisonous and deleterious substances.

RESTR\_STD = the 90<sup>th</sup> percentile, at or below which the station would meet restricted criteria.