

Chapter 12

Point Sources of Pollution

Priority Problems

The impacts of point source discharges on water and sediment quality in Galveston Bay have been studied for years. Point source discharges come from municipal and industrial facilities, bypasses and overflows from municipal sewage systems, unpermitted and illegal discharges, and produced water from oil and gas operations. Since the 1970s pollutant loads from large municipal and industrial facilities have been closely controlled through state and federal permitting rules. The permitting process has been successful in reducing the concentrations of pollutants entering the system from these sources. As a result this action plan focuses on sewage bypasses and overflows, illegal connections to storm sewers, and oil and gas field operations.

Raw or partially treated sewage continues to enter Galveston Bay from Publicly Owned Treatment Systems (POTWs) due to design and operational problems, especially during rainfall runoff. These charges contribute to eutrophication, bacterial contamination, shellfish harvest closures, and other water quality problems. Illegal storm sewer connections also contribute to this problem. Oil and gas produced water discharges high concentration salts and hydrocarbons which also have deleterious effects on water quality and aquatic life

Management Goals and Objectives

The following high priority management goals are established by *The Plan*:

- Elimination of wet weather sewage bypasses/overflows,
- Elimination of pollution problems from poorly operated small wastewater treatment plants,
- Eliminate illegal connections to storm sewers, and
- Eliminate harm from produced water discharges.

To achieve these goals the following plan objectives and management action plans were adopted:

Objective 1	By 2004, develop sufficient capacity to control a 5-year storm.
Action PS-1	Determine location and extent of bypass/overflow problems.
Action PS-2	Eliminate or reduce bypass and overflow problems.
Objective 2	By 2004 ensure that all POTWs operate in accordance with permit requirements, and consolidate small plants where feasible.
Action PS-3	Regionalize small wastewater treatment operations.
Action PS-4	Improve compliance monitoring/enforcement in small treatment plants.
Objective 3	By 1997, eliminate all identified illicit connections to storm sewers.
Action PS-5	Implement a dry-weather illegal connection program.
Objective 4	Eliminate harm from produced water discharges to Galveston Bay by 1997.
Action PS-6	Issue NPDES Coastal General Permits or eliminate harm from oil field produced water discharge.

Data Information Needs

Monitoring effectiveness for this action plan will consist of primarily programmatic monitoring. The plan requires actions at local levels which will result in reduced pollutant discharges, especially of fecal coliform bacteria, to the Galveston Bay system. It is not within the scope of this monitoring element to evaluate water quality on such a site-specific level that it will provide the specific information required to answer these questions. The GBRMP will address the larger issues of overall loadings to the bay and impacts to the bay from such loadings.

Programmatic Monitoring

Specific tracking responsibilities for The Program are given in *The Plan*, so little will be said about these requirements. Objectives within this action plan are directed toward ceasing certain activities, therefore program success will be measured at the level at which these activities take place. In a broader context of environmental monitoring they are addressed in the water quality element of the monitoring plan (Chapter 10). Each of the actions PS- 1,2 & 5 requires the development of local programs to address the issue of illicit connections, bypasses and overflows. Preliminary success of the plan action will be determined through compliance with requirements. Bay area permit holders will be surveyed for development and adoption of:

- Specific programs to evaluate bypass/overflow problems,
- Corrective action plans to eliminate identified problems, and
- Dry-weather illicit connections to storm sewer systems.

NPDES and state permit holders are required to report any bypass or overflow incidents both to the state and EPA. Reductions in reported incidents and volumes of bypass/overflow per incident will be evaluated by this program as a potential measure of action plan success.

Plan action PS-4 calls for the evaluation of EPA and TNRCC compliance monitoring and enforcement strategies. Two positive outcomes of this evaluation, according to the plan, would be a shift in focus toward smaller systems and increased commitment and funding for these programs. The number of inspections performed and the relative percent dedicated to smaller systems can be monitored as a relative measure of success. Programmatic monitoring for evaluating progress for produced water discharges will include tracking the permit issuance process.

Environmental Monitoring

The greatest impact of this action plan would be in the reduction of untreated sewage entering the bay system. This is traditionally measured in terms of fecal coliform bacteria counts. Both the Regional Monitoring Program and the TDH National Shellfish Sanitation Program will provide information on fecal coliform counts in Bay and tributary waters. This program regularly monitors fecal coliforms often after rain events. As previously stated much of the impact to this resource is attributed to non-point sources. Illegal bypasses and overflows are usually associated with precipitation events as are non-point sources. Trends in fecal counts in areas most impacted by point source discharges would be the first to show improvements. The monitoring steering committee will work with program staff to locate monitoring stations in these high impact areas.

The City of Houston, Department of Public Works and Engineering (DPW&E) conducts a dry-weather discharge monitoring program which will be incorporated into the tributary monitoring element of the regional monitoring program. As part of this program DPW&E monitors 45 stations in the tidal and non-tidal portions of Houston's major bayous. Most sites are sampled weekly. Parameters monitored include DO, temperature, pH, ammonia nitrate, BOD TSS, conductivity and fecal coliform. The Galveston Bay Program office will work with other entities to encourage implementation of such monitoring programs as part of their responsibility to identify and correct illicit sewer connections.

An additional, but largely localized, point source of pollutants to the Bay are produced water discharges. In the process of recovering oil and gas, brine or produced water is withdrawn from underground formations. The Texas Railroad Commission reports that in 93 discharges were permitted in 1991, discharging up to 15.2 million gallons of produced water per day (mgd) to Galveston Bay and its tributaries. By 1993 this number had been reduced to 62 with a daily discharge estimated at 5.8 mgd.

Substantial negative impacts are associated with such discharges especially in low energy and near shore environments. Some observed effects are; oil sheens, contamination of sediments with oil and chlorides, elevation of and chemical alteration of salinity, and toxic lethal and sub-lethal impacts to plant and animal

life. Because of the localized effects of such discharges it is unlikely that the Regional Monitoring Program will detect impacts from produced water discharges.

Plan objective 4 (Action PS-6) calls for the elimination of harm from produced water discharges. The monitoring plan does not, at this time, recommend a specific monitoring element directed at this action. If implemented the proposed EPA permits would result in discharges from this source ceasing, and therefore reducing harm. In this case a survey of selected impacted areas would be conducted over a limited lifetime to document recovery. If a treatment process for produced water is developed instead, and there are no monitoring provisions in the permit to assure reduced harm, then a sampling element would be developed. This monitoring element would include benthic surveys, sediment chemistry, and possibly sediment toxicity testing.