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MEMORANDUM
October 29, 1984

To: Kyle Cook

Through: Dick Cunningham and Lynn Singleton

From: Joe Joy

Subject: Pacific Beach Receiving Water Study: Scope of Work Proposal

Purpose

I was asked to respond to your request of October 4, 1984, and propose a limited study at Pacific Beach. To better serve your purposes, I visited Pacific Beach on October 4 to become more familiar with the situation. My proposal is based on my perception of your needs, tempered by the findings of my visit to the site.

The main concerns of the regional office center around disinfection of the Pacific Beach effluent. The region wants to ensure adequate bacterial mortality to protect human health at the recreational areas on the ocean shore. However, they also want to protect the fishery resource against chlorine toxicity. Also involved are dechlorination cost considerations.

The purpose of the study would be to obtain field data and provide the region with a better estimate of chlorine dilution characteristics of the Pacific Beach effluent. This would be done by obtaining the following data:

- effluent and receiving waters discharge measurements
- residual chlorine concentrations in the effluent and receiving waters
- physical measurements of the receiving waterbodies

These data would provide dilution information and travel times necessary to evaluate the impact of chlorine on the receiving water.

Memo to Kyle Cook
Pacific Beach Receiving Water Study: Scope of Work Proposal
October 29, 1984

Site Description

Pacific Beach has recently renovated its sewage treatment system. The current system is a two-cell lagoon with post-chlorination capabilities. The system will also include dechlorination capabilities when the equipment arrives and is installed.

In 1984, flow from the system has ranged from a low monthly average of 0.05 MGD to a high monthly average of 0.24 MGD (January through June Discharge Monitoring Reports [DMRs]). However, recent changes in the collection system may have changed the volume of effluent discharged.

Effluent is discharged into a small unnamed creek leading approximately 0.2 mile to Joe Creek (Figure 1). Joe Creek is tidally influenced and flows approximately 1.5 miles farther to the Pacific Ocean.

The outfall and receiving waters are not easily approached because of the steep terrain and thick underbrush. The only fairly accessible points in the receiving water system can be made along the abandoned and overgrown railroad grade paralleling the county road to Aloha. From this railroad grade, a beaver pond was observed on the unnamed creek between the outfall and the confluence with Joe Creek.

Study Design

Field data will be collected on two occasions within the next two months to define a range of dilution characteristics. An attempt will be made to obtain data during a high receiving water discharge period and a relatively low discharge period. The dates for field work will be dependent upon weather conditions and coinciding tide levels. During each occasion, tidal effects on Joe Creek will be measured and evaluated.

Discharge measurements will be obtained at five sites (Figure 1). A magnetic flow meter, top-set staff, and tape measure will be used to obtain measurements in receiving waters at least twice during each occasion. Efforts will be made to coincide measurements with tidally influenced areas of Joe Creek and the unnamed creek with high and low tide periods. Effluent discharge measurements will be done using the Manning^{R} portable flowmeter on the chlorine contact chamber behind an existing broad-crested weir. These measurements will be compared to measurements obtained by difference, from the upstream and downstream discharges relative to the outfall.

Channel measurement of the unnamed creek will be made for estimates of travel time. In terms of retention and travel times, the beaver pond is of special interest. Surface area and mean depth of the pond will be investigated. Tidally induced changes in the breadth and depth of Joe Creek will also be investigated for travel time purposes.

Chlorine residual will be measured at the outfall and at the head of the beaver pond (Figure 1). If initial chlorine samples from the water below the beaver dam are positive, chlorine sampling will continue downstream into Joe Creek. The DPD ferrous titrimetric method will be used to measure chlorine residual. Temperature, pH, and dissolved oxygen measurements will also be taken.

Field data will be analyzed and compared to existing information (Table 1). An analysis of the receiving water discharge and chlorine dilution characteristics will be reported. If the combined data are adequate, a monthly discharge hydrograph will be constructed. The hydrograph would provide an estimated range of monthly discharges.

The analysis and draft report should be complete within one month from the completion of the final field sampling date.

JJ:cp

Attachments

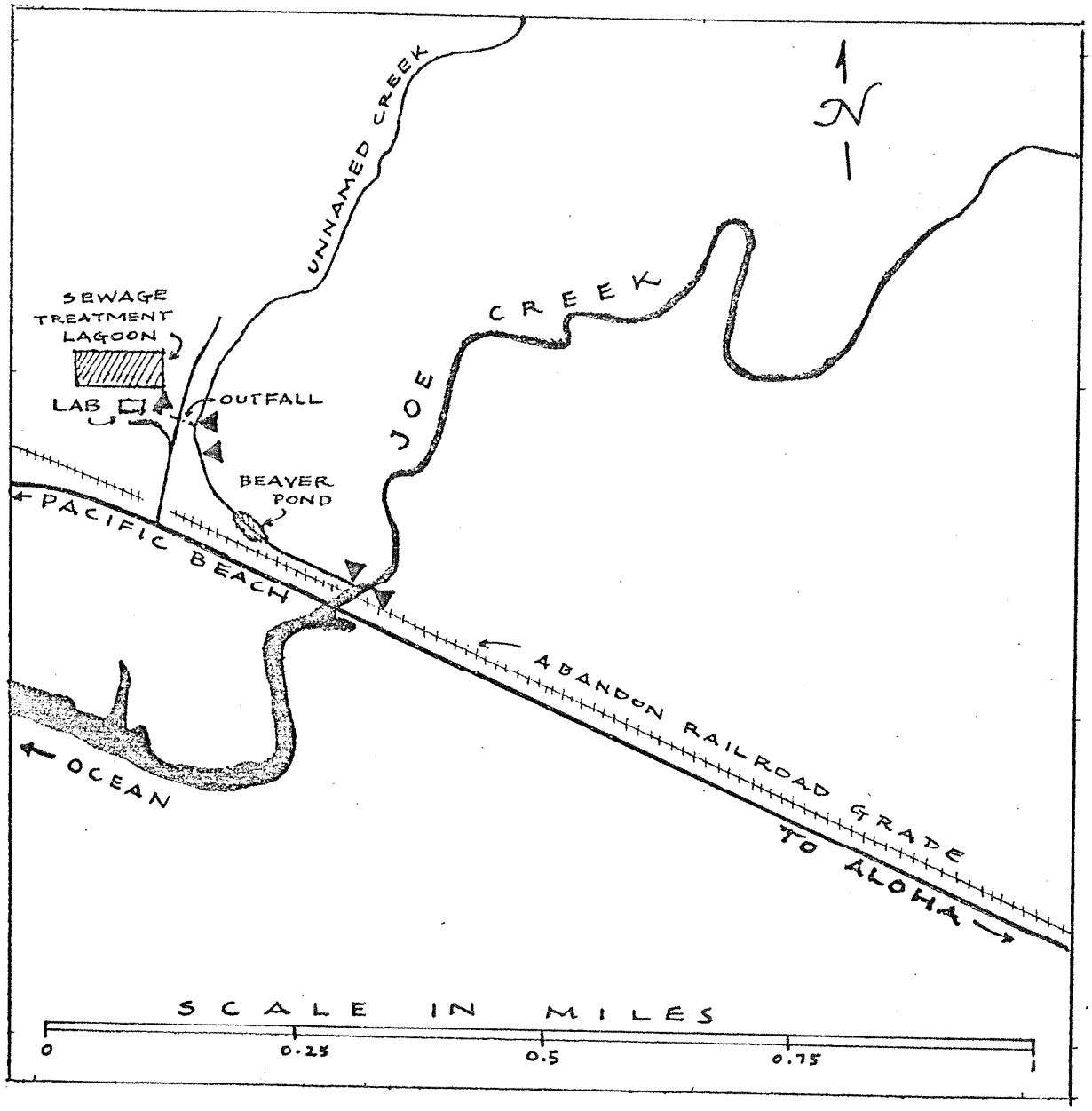

Figure 1. Pacific Beach sewage treatment lagoon and receiving waters. Discharge measuring stations (▲) are indicated.