



United States Department of the Interior

GEOLOGICAL SURVEY
District Office
Water Resources Division
Room W-2234, Federal Building
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Sacramento, California 95825
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October 12, 1988

Mr. Alex E. Dong
Head, Environmental Operations Section
Western Division
Naval Facilities Engineering Command
Post Office Box 727
San Bruno, California 94066

Dear Alex:

In regard to your request to have the U.S. Geological Survey (Survey) assist the U.S. Department of the Navy (Navy) in the characterization of surface-water runoff and storm-sewer discharges at Hunters Point Annex, the Survey believes only qualitative results of flow volumes and constituent loadings could be obtained, unless significant modifications are made to the present drainage system.

The Survey's approach to a quantitative study would be to (1) implement a storm-water runoff quantity- and quality-data collection program and (2) use these collected data in the application of a rainfall-runoff mathematical model to generate long-term records and frequency analyses. The most desirable approach for monitoring the runoff from the Annex would be to have runoff quantity- and quality-monitoring instrumentation installed near the invert of one of the larger storm drain pipes that services a significant part of the Annex' drainage area. The 6-foot diameter mainline storm drain running parallel with "K" Street on the southwest side of the Annex, would be an ideal location for such monitoring, if it was not affected by intrusion of seawater. Review of the maps and plans of the Annex' storm-drain system suggest that seawater is present within the primary storm-drain pipes almost 100 percent of the time.

The presence of seawater would cause significant problems on the monitoring of the quantity and quality of runoff. The flow rate within the mainline storm drain probably could be monitored. However, it would be extremely difficult, if not impossible, to separate the tidal flows within the pipe from the monitored flow data to obtain the storm-runoff hydrograph needed for model calibration. If a storm-runoff hydrograph could be extracted, it would be distorted with respect to magnitude and timing of the runoff peak. This distortion would make calibration of a model very difficult. The presence of seawater also would dilute almost all runoff quality samples. In addition, sloshing within the pipe would greatly distort the timing of the monitored contaminant hydrograph when compared to the computed hydrograph from the model. The exposure of the monitoring equipment to the corrosiveness of seawater would greatly increase the chance of instrumentation failures.

A possible approach to increasing the success of a monitoring program would be to exclude seawater from the system by plugging the mainline between the outlet and the 30-inch line that enters near Mahan Street and using a water-level activated pump to remove the runoff water from the mainline to the bay (see attached illustration). The 30-inch line entering the mainline from Mahan Street also would need to be plugged. The monitoring site possibly could be located in the section of pipe along Manseau Street between "J" and "K" streets. The removal of seawater from the system also would enable one to investigate ground-water infiltration into the storm-water drainage system during non-storm runoff periods.

If the Navy were to pursue this approach, an engineering feasibility study on the effectiveness of a pump to remove runoff water would be required. The feasibility study and the installation of the plugs and pumps are not within the Survey's scope of expertise.

An approach to a qualitative study would be to (1) apply a rainfall-runoff model to estimate storm runoff and (2) collect surface-storm runoff quality samples from representative areas. Contaminant loads, subsequently, could be estimated by applying the concentrations from the samples to model generated runoff values. This approach has severe limitations because the model can not be calibrated and the relation between contaminant concentrations of surface-runoff samples to the concentrations of total runoff can not be determined. In addition, this approach would require an extensive number of surface-runoff samples requiring considerable manpower and the ability of the manpower to respond quickly to storm events. The Survey would have extreme difficulty in meeting these requirements. This qualitative approach also would not be able to characterize the quantity and quality of ground-water infiltration into the storm drains.

If you have questions concerning these two approaches, please do not hesitate to call me at (916) 978-4633.

Sincerely,



Peter W. Anttila
Assistant District Chief for
Hydrologic Investigations

Attachments

ILLUSTRATION

ASSISTANCE TO STORM WATER SAMPLING PROGRAM

THE ABOVE IDENTIFIED ILLUSTRATION IS NOT
AVAILABLE.

EXTENSIVE RESEARCH WAS PERFORMED BY
SOUTHWEST DIVISION TO LOCATE THIS
ILLUSTRATION. THIS PAGE HAS BEEN INSERTED
AS A PLACEHOLDER AND WILL BE REPLACED
SHOULD THE MISSING ITEM BE LOCATED.

QUESTIONS MAY BE DIRECTED TO:

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