

SUPPORT AGREEMENT

BETWEEN

SAUVIE ISLAND DRAINAGE IMPROVEMENT COMPANY

AND

THE DEPARTMENT OF THE ARMY

Pursuant to an MOA between Sauvie Island Drainage Improvement Company ("SIDIC") and the Department of the Army ("DA"), the SIDIC and DA enter into this Support Agreement (SA) as set forth below.

Scope of Work:

US Army Corps of Engineers, Portland District will evaluate the ability of levee system managed by SIDIC to provide protection from the 1-percent-annual-chance flood. Portland District will use the criteria outlined in Section 65.10(e) of the National Flood Insurance Program (NFIP) regulations.

Federal Emergency Management Agency (FEMA) will accept certification from another Federal agency that an existing levee system is designed and constructed to provide 1-percent-annual-chance flood protection in lieu of the requirements outlined in Paragraphs 65.10(b)(1) through (7) of the NFIP regulations. DA is an approved Federal agency that can complete the documentation.

DA requires that the levee evaluations be completed in accordance with EC 1110-2-6067 which requires very specific evaluation and analyses to be completed before a levee can be deemed as providing the 1-percent-annual-chance flood protection.

Periodic Inspections (PI) were completed on the SIDIC levee. Prior to entering this agreement, SIDIC must have addressed all unacceptable items from the most recent PI report and provide documentation of the corrective actions taken or planned in a letter to DA. If there are unacceptable items that are weather dependent, then the letter must address how and when these items will be addressed. Work will not be initiated by DA until any weather dependent unacceptable items have been addressed.

The Scope of Work includes the following:

- a) Review available information including design memorandums, analyses, and as-builts, subsurface information, inspection reports,

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recent surveys, levee construction records, performance history, operation and maintenance manual, and documentation of repairs and upgrades to the levee.

- b) Determine assurance of providing protection from overtopping by 1% annual chance exceedance flood. This is determined using HEC FDA model which has three inputs including a) discharge-frequency analysis with uncertainty from a hydrology analysis; b) hydraulic analysis with uncertainty from HEC RAS modeling; and c) levee analysis that combines water surface elevations and levee performance. The output from the FDA model will provide the elevation where there is a 90 percent and 95 percent assurance of containing the 1% annual chance exceedance flood. If there is more than 3 feet of freeboard above the expected 50 percent base flood stage, then the levee height will need to provide 90 percent assurance of safely passing the 1% annual chance exceedance flood. If there is between 2 and 3 feet of freeboard above the expected 50% base flood stage, then the levee height will need to provide 95 percent assurance of safely passing the 1% annual chance exceedance flood.
- c) Wave overtopping analysis with limited wind speed evaluation.
- d) Review Interior Drainage Study completed by others. Verify that the existing interior drainage system provides adequate protection during a 1% annual chance exceedance event flood. Review periodic inspection reports and operation and maintenance plans for interior drainage system.
- e) Complete a field inspection of all levee system components. A second field inspection may be required if deficient items are noted in the first inspection that must be addressed or repaired.
- f) Complete an evaluation of foundation and levee stability, through seepage, underseepage of levee system, seepage induced piping, effectiveness of gravity drains, closure structures, toe drain performance, corrosion of drain pipes, bearing capacity, settlement, and overtopping performance using deterministic analyses applying appropriate factors of safety against unacceptable performance. The geotechnical deterministic analyses shall be based on the elevation determined in item (b), either the 90 or 95 percent non-exceedance (assurance) of the 1% annual chance exceedance flood elevation. If it is determined that the available geotechnical information along the levee system is not adequate, there is a potential that geotechnical exploration will be required. If exploration is necessary, it can be completed by SIDIC based on input from DA.

- g) Complete a system evaluation of combination of risk from multiple hydraulic sources (if necessary).
- h) Complete an evaluation of failure modes including erosion, erosion protection, and erosion rates.
- i) Evaluation of structural components including steel closure structures, pump stations and flood walls (if present).
- j) Evaluation of mechanical and electrical condition, performance and reliability of pump stations and other components reliant on mechanical and electrical systems for successful operation during 1% annual chance exceedance flood.
- k) Evaluate Operation and Maintenance Plan including operation plan for all closure devices and interior drainage features, flood warning system, and periodic operation of equipment.
- l) Evaluate Emergency Response Plan.
- m) Evaluate probability and consequences to public and property due to capacity exceedance. Evaluate the project features for capacity exceedance.
- n) Evaluate current as-built plans.
- o) Provide a NFIP Levee System Evaluation Report (NLSER) with a positive or negative NFIP Levee System Evaluation finding. The NLSER will summarize the results and conclusions of the levee evaluation in a letter report.
- p) Complete an agency technical review of the NLSER and analysis.
- q) Provide final NLSER and letter of recommendation (if positive NFIP Levee System Evaluation finding) signed by the Portland District Levee Safety Officer to SIDIC.

Note: The initial hydraulic analysis will assume a 1% annual chance exceedance flood (ACE) occurs on the Columbia and Willamette Rivers and the Multnomah Channel at the same time. If the levee height is insufficient for this scenario then a coincident analysis will be required to determine the actual ACE on the Willamette River and Multnomah Channel when the Columbia River is at a 1% ACE and the actual ACE of the Columbia River when the Willamette River and Multnomah Channel are at a 1% ACE. The hydraulic analysis will be redone using the actual 1% ACE found in the coincident analysis. A contingency of \$100,000 is included in the estimated costs to cover the coincident analysis or any geotechnical exploration that is required as referenced in Paragraph (f).

Estimated Cost: \$ 323,000

Per Article V1 of the Memorandum of Agreement, under 10 USC 3036(d) any reimbursable work to be undertaken by the Corps of Engineers on behalf of non-Federal interests (SIDIC) must involve Federal assistance. For the purposes of this MOA, SIDIC has received Federal funding from the National Resources Conservation Service (NRCS), which has approved the use of these funds for purposes outlined in Article 1. The NRCS has supplied 5% of the estimated cost (\$16,150). SIDIC will supply the balance totaling \$306,850.

The work of Phase 2 will be completed by **31 December 2018**.

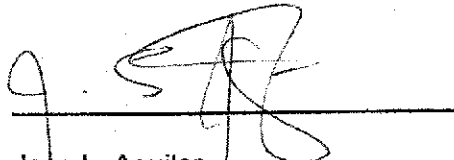
The DA's Principal Representative shall be Mr. Jason McBain (503-808-4834)
The SIDIC's Principal Representative shall be Mr. Tim Couch (503-621-3397)

This SA shall become effective when signed by both the SIDIC and the DA.

Sauvie Island Drainage
Improvement Company

US Department of the Army





David Fazio
Sauvie Island Drainage Improvement
Company

Jose L. Aguilar
Colonel, Corps of Engineers
District Commander

DATE: 10-16-2015

DATE: 2015 11 10

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