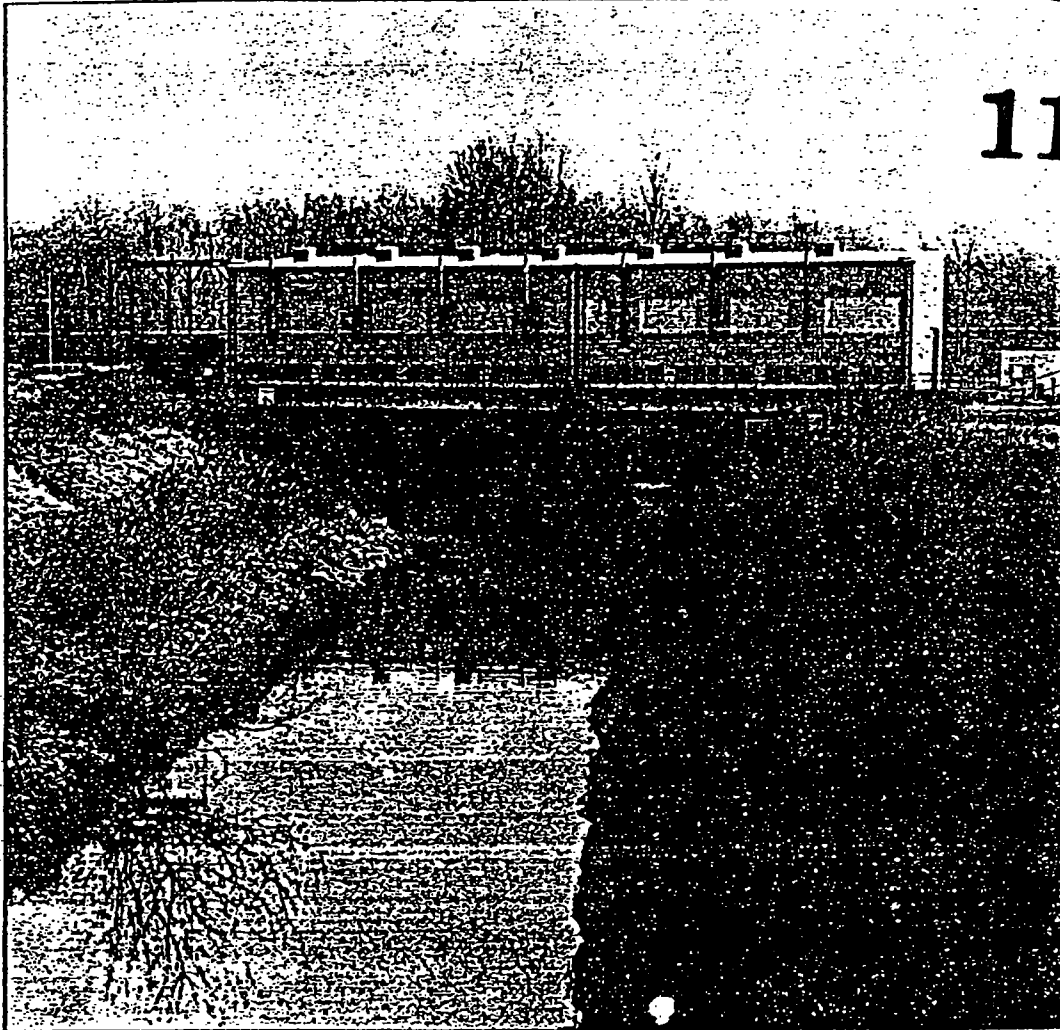


FINAL Green River Pump Operations Procedures Plan

2002 443

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Green River Basin Program

Serving Auburn, Kent, Renton, Tukwila and King County

PUMP OPERATIONS PROCEDURES PLAN

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PUMP OPERATIONS PROCEDURES PLAN

I. Introduction

In accordance with Section I of the Green River Management Agreement (GRMA), dated July 18, 1985, the Cities of Auburn, Kent, Renton, and Tukwila, and King County have agreed to operate existing pumping facilities to drain interior flood waters and to control future pumping operations to reduce the risk of levee overtopping or failure of the Green River levee system.

The work program (Exhibit A) of the GRMA requires the preparation of a first phase pump operations plan to implement Section I of the Agreement. The Pump Operations Procedures Plan set forth is intended to fulfill this requirement. These procedures will also accomplish the following additional objectives, pursuant to requirements set forth in Sections II and IV of the GRMA.

- A. Increase the level of certainty of flood protection, aid in controlling the cumulative effect of surface drainage into the Green River, and enhance water quality.
- B. Establish guidelines for the design, construction, operation, and inspection of new pumped and pressurized drainage systems, as defined in Section III; to ensure proper function and to control or reduce pollutant discharge.
- C. Establish guidelines for the design, construction, and inspection of gravity outfalls into the Green River to ensure proper function and to control or reduce pollutant discharge.
- D. Coordinate pumping with levee monitoring and flood warning operations.
- E. Establish procedures for Green River Basin Technical and Executive Committee review and approval of future discharges into the Green River.
- F. Establish procedures for the granting of exceptions from Pump Operations Procedures.
- G. Provide for periodic review and amendment to the Pump Operations Procedures Plan, which will include an evaluation of the efficiency of pollution abatement design requirements.
- H. Outline training programs for pump plant operators and support personnel, which will include methods of pollutant spill control and minor clean-up procedures.
- I. Provide support documents in the form of appendices to aid in the implementation of the Pump Operations Procedures Plan.

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II. Operations of Existing Pump Facilities

Four existing pump facilities have been identified on the Green River, three of which are addressed in the GRMA. An update of current operating procedures at the pump facilities indicates the operating capacity of each is overstated in the GRMA, and more closely fits the following:

TABLE 1

	<u>Installed Capacity</u>	<u>Capacity per GRMA</u>	<u>Current Operating Capacity</u>	<u>Responsible Party</u>
Black River (P-1)	2,945 cfs	1,375 cfs	889 cfs	King County
Tukwila (P-17)	100 cfs	100 cfs	58 cfs	King County
Kent	90 cfs	90 cfs	15 cfs	City of Kent

The Tukwila and Kent pump plants may operate up to the limits of their installed capacity, provided that the Black River (P-1) pumps are further controlled in accordance with Table 2, below.

The fourth pump facility, located in Kent, is currently owned by Union Pacific Railroad, but will be taken over for operation and maintenance by the City of Kent Surface Water Utility. The pump is not currently operational, and has a capacity of less than 5 cfs. Future plans for the pump are uncertain at this time, but drainage in the area will, in all likelihood, be diverted via pressurized line to a proposed new facility. Future operation of this facility and of any increase in the installed capacities at the Kent P-1 and P-17 facilities will be in accordance with Section III of these procedures.

Operations for the P-1 facility is further outlined in the GRMA as follows:

TABLE 2

<u>Measured Flows at Auburn Gage (cfs)</u>	<u>P-1 Maximum Allowable Pumping (cfs)</u>
Less than 9,000 cfs	As required
9,000 cfs	2,945 cfs*
9,500 cfs	2,900 cfs
10,000 cfs	2,400 cfs
10,500 cfs	1,900 cfs
11,000 cfs	1,400 cfs
11,500 cfs	900 cfs
12,000 cfs	400 cfs to zero
	depending on monitoring by King County Director of Public Works or his designee. Further restrictions on P-1 pumping capacity may be required per paragraph 1.3 of the GRMA.

*) Assumes full installed capacity is available.

These operating procedures will be followed unless the King County Director of Public Works or his designee determines that river capacity will allow additional pumping beyond the levels shown.

A. Stand-By Procedures

All three existing pumps automatically begin pumping operations when specified levels in storage capacity are reached. However, these automatic systems can be overridden and placed on fully manual operation.

- o When flows at the Auburn gage exceed 7,000 cfs and continue to rise, or during other high flows and storm events as determined by the Director of Public Works for King County, the Black River (P-1) pump facility shall be staffed on a continuous basis.
- o When high flows and/or storm events pose concern for malfunction, as determined by the Director of Public Works for the City of Kent, the Kent pump facility shall be staffed on a continuous basis.
- o The Tukwila (P-17) pump plant shall be checked on a periodic basis, at least once a day during high flows and/or storm events, to ensure proper operation, and to perform preventive maintenance as required.
- o Before existing pumps begin pumping, accumulated oil in stored water should be removed.

B. Emergencies and Malfunctions

Alarm systems are installed at the P-1, P-17, and Kent pump plants to warn of malfunctions.

1) P-1 and P-17

The alarm systems for P-1 and P-17 pump plants are located at the King County Renton Shop Complex, 155 Monroe Avenue N.E., in the electrical room of the A Building. The alarm sounds automatically when a possible malfunction occurs at either P-1 or P-17 pump plants.

When the alarm sounds, the pump plant operator shall be contacted by phone or radio. If the operator cannot be reached, the alternate daytime and after-hours personnel listed at the Renton Shops Dispatch Desk shall be contacted. The operator or alternate shall go to the pump plant and check all functions to determine if a malfunction has occurred. Once a malfunction or false alarm has been detected, the operator will call the Renton Shops at 255-2531 to inform them of the problem. Once the malfunction or false alarm has been handled, the pump plant operator or alternate will go to the Renton Shops and reset the alarm.

2) Kent Pump

The alarm system for the Kent pump plant is located in the control room of the Public Works office. It is monitored 5 days a week, 8 hours a day, by a control room operator. At night and on weekends, the alarm is monitored from a remote control center at the Police Department.

When the alarm sounds during the day, the operator shall contact the maintenance crew person by phone or radio. The maintenance person shall go to the pump plant and check all functions to determine if a malfunction has occurred. Once a malfunction or false alarm has been detected, the operator shall call the Kent Office at 872-3395 to inform them of the problem. Once the malfunction or false alarm has been handled, the control room operator will reset the alarm.

When the alarm sounds during the night or on weekends, the dispatcher at the Police Department shall call a maintenance crew person on a list kept at the Police Department. This maintenance crew person shall follow the same procedure as outlined above for malfunctions occurring during the day.

C. Emergency Shutdown Procedures

The Green River Management Agreement, Section 1.3, requires shutdown of pumping as follows:

"In accordance with the Pumping Operations Plan, all plants will be subject to shutdown in the event the King County Director of Public Works or his designee determines that there exists a substantial risk of imminent levee failure or overtopping or for public safety emergency."

In the event circumstances as described above occur, the King County Public Works Director or his designee shall contact the pump plant operator (or alternates) of P-1 and P-17 by phone, at 255-2531, or by radio, and instruct the operator to immediately shut down pumping operations. Similarly, he will call the City of Kent Utility supervisor or alternate, at 872-3395, and instruct the supervisor to immediately shut down pumping operations.

The pump plant operator, the Utility supervisor, or their alternates shall shut down pumping operations and keep a log of the time instruction was received to shut down operations, and the time operations were shut down.

The pump operations shall remain shut down until the King County Director of Public Works or his designee contacts the pump plant operator, the Utility supervisor, or their alternates and instructs them to start up operations.

When a pump station is considered to be the source of oil discharging into the Green River and there is no threat of flooding, the system should be shut down and the oil removed from stored water.

A notice in the log shall be made indicating the time pump operations are resumed, as well as any problems incurred as a result of pump plant shutdown.

D. Coordination with Levee Patrol and Flood Warning Plan

- 1) If practicable, radio monitoring devices, compatible with King County radio frequency, will be installed at the P-1, P-17, and Kent pump plants to ensure timely and adequate communication with pump plant operators. Communication will also be established with METRO's Renton Effluent Treatment Plant to ensure timely and adequate information is received about pumping through the Effluent Transfer System (ETS).
- 2) The pump plant operators will be notified by phone in the event the Green River reaches 8,000 cfs. Upon notification, the operators will monitor radio transmissions to determine if any problem situations are occurring which may require a change or shutdown of operations.
- 3) In the event of significant damage occurring to a levee, or levee failure, levee patrol personnel will immediately contact the Renton Shops via radio transmission, or via telephone, if radio transmission is not possible. The King County Director of Public Works or his designee (the King County Flood Emergency Director) will make a decision about continued operation of pumping operations.
- 4) If shutdown of operations is ordered, the Renton Shops Dispatcher will phone the pump plant operators to order immediate shutdown of pumping operations.
- 5) If a "ready alert" is ordered, the Renton Shops Dispatcher will phone the pump plant operators to advise them to be ready to shut down operations if necessary.
- 6) It is agreed that water quality should not be an issue when property or life is threatened by potential flooding.

III. New Pumping Plants and Pressurized Outfalls

The following procedures and guidelines apply to new pumping facilities and pressurized outfalls as defined in Section V.A, below, which are constructed to discharge into the Green River after the effective date of adoption of the GRMA (July 18, 1985).

A. General Standards

- 1) All new pumped or pressurized drainage discharges into the Green River shall be designed to limit their operation periods to times when the flow at the Auburn gage is less than 9,000 cfs, per the design parameters stated under Section III.C.(2), below.

- 2) All new pumped or pressurized drainage discharges of 30 cfs or less may discharge directly into the Green River, provided that they meet Condition 1 above and other storage and design standards of this section. Green River Basin Technical Committee approval is not required for these facilities. Nothing in these standards and guidelines shall reduce or eliminate the need for pump station applicants to obtain other required permits and approvals.
- 3) Pumped or pressurized drainage discharges into the Green River of greater than 30 cfs shall not be authorized without the review and approval of the Green River Basin Technical Committee (BTC). Procedure for BTC approval is outlined in Section III. D of these guidelines. The BTC review and approval shall not dismiss the applicant from obtaining all other required permits and approvals.
- 4) The design for discharge capacity of new drainage systems authorized in 3 above will include an assessment of the costs and benefits of on-site storage and outlet reduction of peak discharge versus the costs and benefits of increasing the Green River channel capacity to accommodate the required outlet. This assessment shall accompany the materials provided to the BTC for their review and approval.
- 5) Pumped or pressurized drainage discharges into the Green River diminish the available channel capacity in the river to pass flood flows and aggravate the freeboard condition on the existing levee system. Parties to the GRMA, approving drainage discharges pursuant to this Section prior to the time a levee improvement is completed should seek a formal commitment from pump station applicants for funding their proportionate share of levee improvement plans.
- 6) All pumped and pressurized drainage systems as defined in Section III, discharging to the Green River, subsequent to the adoption of the POPP, should be required to have pretreatment devices for oil and sediment removal. This treatment shall be consistent with guidelines to be developed under Section I. 5.

B. Storage Requirements

- 1) Storage facilities for drainage shall be designed to accommodate a 100-year flood event, for a seven-day duration.
- 2) To the maximum extent possible, storage facilities shall be designed for multi-purpose uses, including wildlife and fisheries habitat, open space and recreation, oil/water separation and bio-filtration of runoff for water quality, and other environmental factors.
- 3) Storage facilities should have design provisions for regular cleanout and removal of oil, trash, and sediment.

C. Design Parameters

- 1) Pumping facilities shall include a primary pump and a least one backup pump with the same capacity as the primary pump for use in case of primary pump malfunctions or is out of service.
- 2) Pumps and pressurized systems shall be designed for automatic shut-down whenever the river stage exceeds the 9,000 cfs elevation at that location, based on the Green River profiles (Appendix A), with a manual override.
- 3) No discharge shall be allowed into the Green River when flows measured at the Auburn gage equal or exceed 9,000 cfs. The outfall elevations shall be set at the 9,000 cfs elevation based on the Green River Profiles (Appendix A) or shall provide access for visual inspection of flows through the outfall when the river stage equals or exceeds this elevation unless otherwise approved by the BTC.
- 4) Outfalls placed through levees shall require that the levee be rebuilt or restored to King County standards as contained in Appendix D.
- 5) A minimum 15-foot-wide easement shall be provided to the party having jurisdiction for the pump. The easement is required for access to and inspection of pump plants and associated facilities, including the outfall system(s).
- 6) All private pumps shall be transferred to the local jurisdictional agency within 60 days of final inspection approval, or no later than October 1 of that same year, whichever is greater.
- 7) All proposals for new pump plants shall:
 - i) Provide the assessment required in III. A (4), above.
 - ii) Evaluate the need for the new pump as compared to improving, adding, or using the interior drainage system to convey flows to an existing pump facility and using or upgrading that facility.
 - iii) Assess the various alternatives established in (i) and (ii), above, and prepared a benefit-cost analysis of each of the alternatives.
 - iv) Analyze sitting locations which provide the maximum benefit for flood control and related multi-purpose uses to the surrounding communities and jurisdictions. Applicants are strongly encouraged to seek participants in building pump facilities which benefit more than one community or jurisdiction.
 - v) Include adequate methods of reducing degradation of the water quality in the Green River through oil and sedimentation removal plans consistent with guidelines to be developed.

- 8) All design, construction, and operation shall comply with applicable federal, state, and local statutes, ordinances, or regulations, including those administered by local agencies under the Shoreline Management Act of 1971 and all applicable water quality laws.
- 9) At the time of construction, all outfalls shall be inspected by an authorized representative of the local jurisdiction to assure proper placement, alignment, and stability.

D. Green River Technical Committee Review and Approval Process

The GRMA (Section II. 3. 5) requires that "(...) new or added pumped or pressurized discharges into (the) Green River, for drainage flows less than 30 cfs are permitted, provided that they are limited to operational periods when (the) Green River at the Auburn gage is less than 9000 cfs. All other requests for new drainage capacity into the Green River will be reviewed and approved by the BTC."

For the purpose of this review and approval process, the BTC is comprised of Public Works and Planning Directors from King County and the Cities of Auburn, Kent, Renton, and Tukwila.

The process and procedure for required BTC review and approval shall be as follows:

- 1) The proponents will request a review of their proposal before the Green River BTC (representatives from signers of the GRMA) at a regular meeting of the Committee. The request will be sent to the Division Manager of the King County Surface Water Management Division, who will forward it to the BTC.
- 2) The request will be included in the agenda for the first meeting of the month following the month in which the request is received.
- 3) The proponents will provide each member of the BTC with a brief report (no more than ten pages) addressing how the proposed project meets each paragraph of Section II. 3 of the GRMA, "Future Discharge Capacity Guidelines." The report must be received by the BTC members at least seven days in advance of the meeting.
- 4) Representatives from at least four of the five jurisdictions party to the GRMA must be present at the meeting.
- 5) The proponents will make a presentation at the BTC meeting, and Committee members may raise questions and issues to be answered.
- 6) The BTC will vote on the proposal with each jurisdiction having one vote, and will act upon their decision as follows:
 - a) Vote to Approve - Affirmative votes from a minimum of three jurisdictions will result in approval of the proposal.

- b) Vote to Defer - A lack of information or similar reasons causing failure of the Committee to receive the minimum votes necessary for approval or denial will result in deferral of the decision on a proposal. The proposal will be rescheduled for a review at the next Committee meeting, at which the proposal must either be approved or denied. The Committee may request further information from the proponent, or attendance of the proponent at the next meeting, to aid in their decision.
- c) Vote to Recommend Denial - Negative votes from a minimum of three jurisdictions will result in the Committee's submittal of a written recommendation to deny the proposal, together with reasons for the denial, to the Basin Executive Committee (BEC).
- 7) All decisions from the BTC to recommend denial of a proposal will be reviewed by the BEC within 90 days from receipt of the recommendations. The BEC will follow the same procedure as that outlined above for the BTC in its review of the proposal. The BEC will act upon its decision in the same manner as the BTC.
- 8) If the BEC votes to deny a proposal, the decision can be appealed to the jurisdiction in which the proposal lies. The appeal will be heard according to the process then in use for that jurisdiction.

IV. Existing Gravity Outfalls

- A. Beginning in March or April, 1987, and continuing annually thereafter at the same time the annual King County River and Stormwater Drainage Maintenance Evaluation is conducted, all outfalls on the Green River between Auburn and Tukwila, inclusive, will be inventoried, and their condition will be assessed.
 - 1) The inventory and condition assessment shall preferably be performed by boat. The time of the inventory and condition assessment may need to be done at a time other than March or April if high river levels preclude adequate visual inspection.
 - 2) The inventory and condition assessment shall be conducted by King County, with two Utility Workers used as Evaluators.
 - 3) Evaluators shall note the size, location, and type of all outfalls and flap gates on standardized "Surface Water Management Facilities Inventory Sheets" (Appendix C). In addition, if possible, all invert elevations will be surveyed and recorded on the Inventory Sheets.
 - 4) Evaluators shall note the existing condition of all outfalls, flap-gates, and surrounding levee areas, based on the King County Maintenance Standards shown on a standardized "SWM Facilities Maintenance Need and Vegetation Inventory Sheet" (Appendix C).
- B. All costs for performing the inventory and condition assessment of outfalls will be charged to the annual Green River Management Agreement budget.

V. New Gravity Outfalls

New gravity outfall systems will be analyzed during the design review process and assigned to one or the other of the following categories:

- A. Pressurized gravity outfalls, which are defined as those outfalls operating under sufficient gravitational head pressurization to continue discharging into the Green River when the river stage at the outfall equals or exceeds the 9,000 cfs elevation, based on the Green River profiles (Appendix A).
- 1) Head pressure in this determination shall correspond to the maximum produced in the system over the course of a 100-year, seven-day-duration storm within the drainage basin area tributary to the outfall in question.
 - 2) Pressurized gravity outfalls meeting this definition will be treated as pressurized drainage discharges subject to the provisions of Section III, above.
- B. Non-pressurized gravity outfalls, which are defined as those which lack sufficient head pressurization to discharge under the same conditions noted in Section V.A., above. Such systems will be subject to the design requirements set forth below.
- 1) Outfalls placed through levees shall re-establish the levees to the standards set up in the Levee Improvement Plan under the GRMA. Outfalls constructed to the completion of the levee improvement plan shall require that the levee be rebuilt or restored to King County standards as contained in Appendix D. All outfalls shall have flapgates unless otherwise approved by the BTC.
 - 2) No discharge shall be allowed into the Green River when flows measured at the Auburn gage equal or exceed 9,000 cfs. The outfall elevation and design of the outfall conveyance system shall be such as to prevent the discharge of flows under the conditions noted in Section V.A., above.
 - 3) Storage facilities for drainage shall be designed to accommodate a 100-year flood event, for a seven-day duration.
 - 4) It is recognized that individual jurisdictions party to the GRMA may wish to grant exceptions to the storage requirements stated under item V.B.(3), above. Any such exception will be subject to the following:
 - a) The proposed exception meets all the requirements of Section VII, below.
 - b) Localized flooding which may occur as a consequence of the exception will occur only within the jurisdiction of the party(-ies) granting the exception.

- c) Localized flooding which may occur as a consequence of the exception will not enter the Green River at other locations, or as uncontrolled discharge, when the river stage exceeds the 9,000 cfs elevation at the discharge location(s) in question, based on the Green River Profiles (Appendix A).
- d) Items V.B.(4)(b) and (c) can be demonstrated for storms up to and including a 100-year, seven-day-duration storm over the basin area tributary to the outfall(s) in question.
- 5) To the maximum extent possible, storage facilities shall be designed for multi-purpose uses, including wildlife and fisheries habitat, open space, and recreation during dry periods, oil/water separation and biofiltration or runoff for water quality, and other environmental factors. Oil and sediment removal shall be designed into all storage facilities.
- 6) All design and construction shall comply with any applicable federal, state, or local statutes, ordinances, or regulations, including those administered by local agencies under the Shoreline Management Act of 1971, and all applicable water quality laws.
- 7) At the time of construction, all outfalls shall be inspected by an authorized representative of the local jurisdiction to assure proper placement, alignment, and stability.

VI. Review and Amendments to Pump Operating Procedures

The parties to the GRMA shall periodically review the Pump Operations Procedures and make amendments thereto as may be necessary.

- A. Individual parties may propose amendments to the plan via the following procedure:
 - 1) The proponents will submit their proposal in writing, together with the background materials and justification, to the Division Manager of the King County Surface Water Management Division, who will forward it to the BTC.
 - 2) The proposal will be included in the agenda for the first meeting of the month following the month in which the proposal is received.
 - 3) The proponent may be present at the meeting of the BTC, but is not required to attend.
 - 4) Representatives from at least four of the five jurisdictions as parties to the GRMA must be present at the meeting.

B. Voting Procedures

The BTC will vote on the proposal, each jurisdiction having one vote, and act upon their decision as follows:

- 1) Vote to Recommend Approval - Affirmative votes from a minimum of three jurisdictions will result in a recommendation to approve the proposal, to be submitted to the BEC for their final action on the proposal.
- 2) Vote to Defer - A lack of information or similar reasons causing failure of the Committee to receive the minimum votes necessary for approval or denial will result in deferral of a decision on the proposal. The proposal will be rescheduled for a hearing at the next Committee meeting, at which the proposal must be approved or denied. The Committee may request further information from the proponent, or attendance of the proponent at the next meeting, to aid in their decision.
- 3) Vote to Recommend Denial - Negative votes from a minimum of three jurisdictions will result in a recommendation to deny the proposal, together with reasons for the denial, to be submitted to the BEC for their final action on the proposal.

C. Mandatory Amendments

The BTC itself shall propose amendments to these operating procedures to the BEC within six months and not longer than one year from the date at which:

- 1) The Corps of Engineers modifies the regulation of the Green River through changes in the operation at Howard Hanson Dam; or
- 2) channel capacity in the Green River is modified by levee improvements; or
- 3) plans are approved for construction of the Mill Creek outfall.

VII. Exceptions from Pump Operations Procedures

An exception from these procedures may be authorized only if extraordinary circumstances are shown and the public interest suffers no substantial detrimental effect. The burden of proving a proposed exception meets both these criteria and the conditions established below shall be on the applicant; absence of such proof shall be grounds for denial of the application.

A. An exception may be authorized when:

- 1) Site conditions or physical limitations make it impossible or substantially impractical for the project to be implemented meeting all design and engineering requirements in these procedures; and
- 2) It can be demonstrated the exception, if approved, will not thwart or be inconsistent with the policies and principles stated in the GRMA.

- B. All exceptions to these standards must be formally submitted to the Green River BTC for review and approval, together with background materials and justification. No exception shall become effective until formally reviewed and ratified by the BEC.
- C. The party(-ies) granting exceptions to the conditions contained herein explicitly assume primary responsibility for less stringent or sub-standard designs and projects, provided, however, that this shall not be construed as in any manner modifying the liabilities or immunities of the parties.
- D. The varying party(-ies) will submit a formal report to the BTC, describing the exception(s) which has/have been granted.

VIII. Pump Operator Training

An annual training program will be prepared and implemented to update and train pump station operators and other support personnel on the procedures and guidelines incorporated herein. The training program will be reviewed and approved by the Green River BTC.

Annual training will incorporate coordination with personnel and procedures established in the flood warning and levee patrol program. Annual training sessions will be conducted prior to the start (October 15) of the flood season on the Green River.

IX. Appendices

- Appendix A - Green River Profiles and Elevations
- Appendix B - Stage-Discharge Tabulations
- Appendix C - Surface Water Management Facilities Inventory Forms
- Appendix D - Interim Typical Cross Section
- Appendix E - Basin Technical Committee Members
- Appendix F - Concerned Agencies

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