

| *WORKING DRAFT (with tracked changes)*

**ATTACHMENT B**

**G-3273 Constraint Relaxation/S-356 Field Test  
and S-357N  
Operational Strategy**

**Prepared by  
Department of the Army  
Jacksonville District Corps of Engineers  
August 2014**

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Note: All elevations are in feet, NGVD of 1929 unless otherwise stated.

G-3273 Constraint Relaxation/S-356 Field Test and S-357N Operational Strategy

August 2014

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**INTRODUCTION**

This Operational Strategy is the first in a series of three related, sequential efforts that will result in a Comprehensive Operating Plan (COP) that is to be incorporated into the Water Conservation Areas, Everglades National Park, and ENP-South Dade Conveyance System Water Control Plan (WCP). Two field tests (Increment 1 and Increment 2) are to be conducted to assist future development of COP water management operating criteria to be incorporated into the WCP through additional National Environmental Policy Act (NEPA) efforts, as required. In addition, interim water management operating criteria for the planned 8.5 Square Mile Area gated culvert 357N (S-357N) will be proposed, refined, and implemented in conjunction with the two field tests. All elevations in this document are in feet, National Geodetic Vertical Datum of 1929 (NGVD) unless otherwise stated.

The first field test (Increment 1) includes proposed water management operating criteria for the G-3273 Constraint Relaxation and S-356 (G-3273/S-356) defined in this Operational Strategy. This Operational Strategy also defines [interim operating criteria a testing protocol](#) for S-357N, which will be incorporated into the first field test following completion of the C-358 seepage collection canal and the associated S-357N control structure. Information obtained from the Increment 1, if successful with achievement of field test goals and objectives, is planned to be used to support development of a second field test (Increment 2) and subsequent consideration of incremental modifications to the 2012 WCP.

Increment 2 is to contain proposed water management operating criteria (Operational Strategy) that will allow higher maximum stages in the L-29 Borrow Canal (L-29) than the 2012 WCP allows as well as refined operating criteria for G-3273, S-356, and S-357N (resulting from information learned from Increment 1). The refined water management operating criteria related to G-3273, S-356 and S-357N will also be incorporated into the WCP (modification to the 2012 WCP). The Increment 2 Operational Strategy and the modifications to the 2012 WCP will be supported by an Environmental Assessment. Information obtained from Increment 2, if successful with achievement of field test goals and objectives, is planned to be used to support development of COP.

[Placeholder to be addressed by WQ Sub-team :](#)

**OPERATIONAL STRATEGY FOR G-3273 CONSTRAINT RELAXATION/S-356 FIELD TEST**

The G-3273 Constraint Relaxation/S-356 Field Test (Increment 1) is a separate and parallel action from the Everglades Restoration Transition Plan (ERTP), which is the successor of the Interim Operational Plan for Protection of the Cape Sable Seaside Sparrow (IOP) 2006. ERTP was implemented in October 2012. The water management operations contained in Increment 1 will be implemented over the period from early 2015 (February/March) through early 2016 (February/March). If weather or other system conditions during this one-year period do not provide sufficient data for a conclusive Field Test, or if the required real estate acquisitions along the

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Tamiami Trail necessary to allow higher maximum stages in L-29 for Increment 2 have not been completed the Field Test may be extended up to one-year for a maximum of two-years.

The intent of this operational strategy is to utilize S-333 and S-356 as the primary structures to best achieve the Increment 1 objectives while maintaining the objectives of ERTTP. The 2012 WCP, including the WCA-3A Regulation Schedule, Rainfall Plan, and the Interim Operating Criteria for the 8.5 SMA Project will continue to govern water management operations during Increment 1, with the exception of operating criteria for S-333, S-334, S-356, S-197, and S-357N as shown in the below operational strategy for use during the Field Test. Data will be analyzed during and after Increment 1 as described in the Analysis and Performance Measures section included below.

Increment 1 will maintain the current operating limit constraint of 7.5 feet in L-29, while no longer having a G-3273 constraint for S-333, and utilizing S-356 for control of the seepage to the L-31N Canal. It is anticipated that during Increment 1, the combined flows through S-333 and S-356 will be more than what would have been discharged through these features under ERTTP operations. Additionally, it is expected that during implementation of water management operations associated with Increment 1 under typical conditions, the combined flows through S-173 and S-331 to the C-111 Basin will be less than what would have been discharged through these features under ERTTP operations.

The G-3273 stage constraint will be removed, with system conditions being continuously monitored and operational adjustments made as needed for the duration of the Field Test. S-333 and S-356 will be utilized as indicated in the below operational strategy during the Field Test. If available for use, S-355A and S-355B may also be utilized to discharge to the L-29 canal as indicated in the 2012 WCP.

**WATER MANAGEMENT RELATED CONSTRAINTS DURING INCREMENT 1**

~~Increment 1 will be subject to various constraints that affect the application of the water management operating criteria contained in this Operational Strategy. The constraints may lead to: the delay of the initial implementation, temporary discontinuation of the Operational Strategy, delayed reapplication of the Operational Strategy, limited implementation of operating criteria within the Operational Strategy, or ending Increment 1. In all cases when the constraints result in the Operational Strategy not being available for use, the water management operating criteria in the 2012 WCP will be applied. The water management related constraints have resulted in the development of specific operating criteria for the L-29 and L-31N canals. The various constraints include the following:~~

- ~~○ S-356 pump availability~~
- ~~○ S-331 pump availability~~

**S-333 AND S-356 OPERATIONAL STRATEGY**

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**Prepared Based on Discussions at the August 28, 2014  
Quarterly Agency Team Meeting**

- ~~Column 2 canal stages will only be utilized during Column 2 operations.~~
- ~~S-197 operations as described in the test plan will continue until construction is completed for C-111 Project's Contracts #8 and #9 unless operation should be reduced or completely eliminated due to unanticipated environmental effects to ENP Panhandle or Florida Bay.~~
  - ~~When the S-18C gate is fully open and S-18C HW exceeds 2.4 S-197 may be operated to release up to a maximum of 200 cfs (daily time weighted average). When S-18C TW falls below 2.3 for 24 hours, S-197 will be reduce as necessary to bring S-18C HW above 2.3 feet in 24 hours. The operation of S-197 will terminate with the completion of construction associated with Contracts 8 & 9.~~
- ~~Supplemental monitoring for Increment 1 as needed in agricultural lands, Southern Glades and Florida Bay. Monitoring will inform future modeling and facilitate evaluation of increments leading up to the Combined Operating Plan.~~

During Increment 1, the L-29 Canal (L-29) will be ~~maintained up~~ managed to prevent a sustained stage above ~~to~~ 7.5 feet (average of S-333 tailwater and S-334 headwater), which is the maximum operating stage intended within the 2012 WCP (ERTP). ~~This will be achieved by stopping inflow into L-29 when the L-29 stage rises above 7.5 feet NGVD. The priority for use of S-333/S-356 operational guidance listed below will be followed. The operation of S-197 will terminate with the completion of construction associated with Contracts 8 & 9.~~

- 1) **Year-round when stage at G-3273 is below 6.8 and WCA-3A stage is below the WCA-3A stage is below Zone A as defined in the IOP not high water in WCA-3A Increment 1 Action Line (Figure 1):** (S-333 has priority; S-356 use is secondary to S-333 but ~~S-356 can and~~ should be used subject to ~~#L-29~~ stage limitations)
  - a) S-333 will be used to release up to the full rate prescribed by Rainfall Plan into NESRS subject only to the L-29 constraint. The combined flow from the S-333, S-12A, ~~S-12B, S-12C, S-12D, S-343A-B, and S-344~~ should not exceed the total prescribed by the Rainfall Plan ~~except as allowed by the ERTTP adaptive language. if the WCA-3A stage is within Zone A as defined by the ERTTP.~~
  - b) S-356 will be used to control the stage in L-31N between 5.5 and 5.8 feet NGVD to the extent there is capacity in L-29 without reducing the ability to release the full allocation through S-333. Compliance with the range limits is based on the daily average stage at S-356/S-336. The SFWMD ~~may has full latitude to~~ turn pumps On an Off within this range. ~~Using S-356 to maintain the L-31N Canal range to 5.5 to 5.8 feet NGVD allows the flexibility to keep G-211 and S-338 closed or reduce G-211 and S-338 discharge if conditions make this desirable. It may be necessary to maintain the L-31N stage at S-356/S-336 below 5.9, to keep the stage below the open criteria for S-338 (5.8) and G-211 (6.0).~~

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c) Excess flow from L-30 through S-335 may be diverted into NESRS using S-356 if desired by the agencies. When S-335 HW is above 6.0 the SFWMD has ~~the full~~ latitude to make the S-335 discharge required to maintain the stage in L-30 and also providing S-335 discharge to reduce cycling at S-356.

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2) **Year-round when stage at G-3273 is above 6.8 and the WCA-3A stage is below Zone A as defined in the IOP not high water in WCA 3A the Increment 1 Action Line (Figure 1):** ~~(S-356 has limited priority)~~

a) S-333 will be used to release up to the full rate of the Rainfall Plan into NESRS subject to the L-29 constraint and an assured minimum available capacity of 250 cfs through S-356. The combined flow from the S-333, S-12A, S-12B, S-12C, S-12D, S-343A, S-334B, and S-344 should not exceed the total prescribed by the Rainfall Plan.

b) S-356 will be used to control the stage in L-31N between 5.5 and 5.8 feet NGVD with an assured minimum available capacity of 250 cfs through S-356 (S-356 limited priority over S-333), subject only to the L-29 constraint. Compliance with the range limits is based on the daily average stage at S-356/S-336. The SFWMD may turn pumps On an Off within this range. Using S-356 to maintain the L-31N Canal range to 5.5 to 5.8 feet between 5.5 and 5.8 feet NGVD allows the flexibility to keep G-211 and S-338 closed or reduce G-211 and S-338 discharge if conditions make this desirable. It may be necessary to maintain the L-31N stage at S-356/S-336 below 5.9 to keep the stage below the open criteria for S-338 and G-211.

3) When G-3273 is above 6.8 and High water in W when the WCA-3A stage is above the Increment 1 Action Line (Figure 1) Zone A as defined in the IOP WCA 3A from 1 November through 14 July (CSSS Closure Period) (S-333 has priority ~~with use of S-334~~ subject to SDCS available capacity)

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a) S-356 is not operated.

b) S-333 makes maximum releases to NESRS subject to L-29 constraint

c) When L-29 constraint is reached or exceeded and:

i) S-12C and S-12D are full open, and

ii) the discharge to tide from all of the WCAs are maximized to the extent that downstream condition allow-, and

~~the SDCS has available capacity (combined pumping rate at S-332B, S-332C, and S-332D is less than 750125 cfs maintaining stage in the lower half of the range).-without S-334 discharge).~~

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iii)

S-334 may be utilized up to a maximum flow rate of 200250 cfs to maintain the L-29 canal stage at or below 7.5.

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d) If S-334 is being utilized, C-111 structures (S-332B, S-332C, S-332D, S-176, S-177, S-18C, S-194, and S-196) are will be operated according to the 2012 WCP Column 2 criteria and S-338 operated consistent with the 2012 WCP-ERTP.

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e) When the S-18C gate is fully open and S-18C HW exceeds 2.4 S-197 may be operated to release up to a maximum of 200 cfs (daily time-weighted average); When S-18C TW falls below 2.3 for 24 hours, S-197 will be reduce as necessary to bring S-18C HW above 2.3 feet in 24 hours. The operation of S-197 will revert to normal operations with the completion of construction associated with Contracts 8 & 9.

~~e) When the S-18C HW exceeds 2.4 S-197 will be operated to release 100-200 cfs (daily time-weighted average); when S-18C HW is above 2.6, and all gates are open full, S-197 will release 300-400 cfs.~~

4) When G-3273 is above 6.8, and ~~When the WCA-3A stage is above the Increment 1 Action Line (Figure 1) Zone A as defined in the IOP High water in WCA-3A (as defined by Sub team in above)~~ from 15 July through 31 October (S-333 has priority with no use of S-334)

- a) S-333 makes maximum releases to NESRS subject only to L-29 constraint
- b) S-356 is not operated and S-334 remains closed.

c) C-111 structures (S-332B, S-332C, S-332D, S-176, S-177, S-18C, S-194, and S-196) are operated according to the 2012 WCP Column 2 criteria and S-338 operated consistent with the 2012 WCP/ERTP.

d) When the S-18C gate is fully open and S-18C HW exceeds 2.4 S-197 may be operated to release up to a maximum of 200 cfs (daily time-weighted average); When S-18C TW falls below 2.3 for 24 hours, S-197 will be reduce as necessary to bring S-18C HW above 2.3 feet in 24 hours.

~~When the S-18C HW exceeds 2.4 S-197 will be operated to release 100-200 cfs (daily time-weighted average); when S-18C HW is above 2.6, and all gates are open full, S-197 will release 300-400 cfs.~~

**WATER SUPPLY OPERATIONS**

No changes to water supply operations are proposed. It is anticipated that water supply deliveries to the SDCS will not be needed when S-356 is pumping. If S-356 is pumping and S-334 and/or S-335 are to be utilized to deliver water supply to SDCS, then S-356 will stop pumping, as stated above.

**OPERATIONAL STRATEGY FOR 8.5 SQUARE MILE AREA**

Consistent with the 2011 Proposed Interim Operating Criteria for the 8.5 Square Mile Area Environmental Assessment and the 2012 WCP, water management operations at S-331 and S-357 during Increment 1 will fall within distinct ranges dependent on water conditions (stages) assessed by Las Palmas Groundwater Gage 2 (LPG2) and C-357 measured at the Las Palmas Canal Gage 1 (LPC1) or S-357 headwater (S357HW). S-357 will have pumping constraints based on the average-daily, north to south groundwater gradient (DELTA) between Angel's Well water level and the Las Palmas Groundwater Gage 1 (LPG1) water level. The S-357 pump station will be operated for the purpose of providing flood mitigation for the 8.5

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SMA. S-357 will be operated to maintain an average-daily water level in C-357 at LPC1 or S357 headwater (HW) between 5.7 to 6.2 feet-NGVD (National Geodetic Vertical Datum of 1929).

During Increment 1 S-331 will be used to 1) provide flood damage reduction for the lands located along the east side of the L-31N Canal, 2) convey excess water from WCA-3A to the C-111 Detention Areas and the C-111 Canal as required by Column 2 operation under the Interim Operation Plan for Protection of the Cape Sable Seaside Sparrow, 3) provide water supply to Taylor Slough, the L-31N, and C-111 Canals, and 4) act as a partial or complete replacement to S-357 should mechanical, permitting issues or seepage impacts limit or preclude the use of S-357.

S-331 will be operated using four pumping ranges: “high”, “middle”, “low” and “low adjustment”, based on LPG2 and S-357 operational ability. S-331/S-173 operations will be triggered based on the S-331 HW elevation. The intent is to have S-357 provide the drainage authorized by the 8.5 SMA 2000 GRR while maintaining or improving the hydroperiods of the wetlands along the west side of the 8.5 SMA protection levee. Only a portion of the S-357 capacity can be used due to the limited infiltration rate provided by the 8.5 SMA’s small detention cell and the inability to overflow this detention cell. Due to the limited pumping capacity at S-357 it is expected that, at times, this capacity will be insufficient to maintain the C-357 Canal at target stages. During these time periods the S-331 operational range will be lowered to assist S-357 in maintaining drainage.

The 2012 WCP does not contain water management operating criteria for the planned spillway (S-357N) located in the 8.5 SMA upstream of S-357, at the intersection of C-357 and the newly constructed seepage collection canal (C-358). The 2012 Design Refinement for the 8.5 SMA Environmental Assessment did not address water management operating criteria for S-357N or C-358 and stated that all gates would be in the closed position until a new operational protocol is developed for the Modified Water Deliveries to Everglades National Park Project. ***Proposed S-357N interim water management operating criteria for utilization during the G-3273 Constraint Relaxation/S-356 Field Test will be developed through coordination with the technical sub-team.***

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The testing protocol for S-357N will be designed to establish the operating criteria for S-357N. A newly installed staff gage at the western end of C-358 will be observed during S-357 pumping. The testing protocol for S-357N will be an iterative approach consisting of 4 to 5 weeks of gate changes during the wet season. The S-357N gate changes will be meant to stress the system.

**Paul to provide additional scenarios for S-357N operating criteria**

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~~2011 Proposed Interim Operating Criteria for the 8.5 Squara Mile Area EA and the 2012 WCP: C-357 operating range is 5.7 to 6.2  
S-357 on trigger is 5.7 in C-357 or S-357 headwater~~

~~Potential operating criteria could be tied to gradients between groundwater (GW) wells along the western boundary and/or within the 8.5 SMA (i.e. Angels Well, G4, G1, G2). The GW gradient between the wells would be used to determine proper open and close criteria for S-357N. The~~

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~~purpose of using GW gradients between the wells would be to provide the current level of mitigation flood mitigation.~~

**ANALYSIS & PERFORMANCE MEASURES**

*[ The monitoring and evaluation methodology for utilization during the G-3273 Constraint Relaxation/S-356 Increment 1 Field Test will be developed through coordination with the technical sub-team ]*

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~~A.~~ A monitoring and assessment plan has been developed.

~~A.B.~~ The list of gages to be used for the analysis is shown in Table 3. A map of the gages and structures is shown in Figure 1.

~~B.C.~~ Post-Field Test, data analysis to quantify seepage into L-31N (~~S-356 should be operated under MWD to mitigate for increased seepage due to MWD implementation, not existing seepage amounts~~) and identify the zone of influence for hydrologic effects.

~~C.D.~~ Post-Field Test, comparison of the volume of water sent to NESRS (S-333, S-355A, S-355B, S-356) during this Field Test (G-3273 above 6.8 feet) to the historical volume (G-3273 above 2012 WCP constraint of 6.8 feet) of water that was sent to NESRS (S-333, S-355A, S-355B).

~~D.E.~~ Post-Field Test, comparison of the volume of water sent to the 8.5 SMA detention cell/ Stormwater Treatment Area (STA) (S-357) and L-31N/C-1W (S-331, S-338) during this Field Test (G-3273 above 6.8 feet) to the historical volume (G-3273 above 2012 WCP constraint of 6.8 feet) of water that was sent to L-31N/C-1W (S-331, S-338).

~~E.F.~~ Post-Field Test, the historic rainfall as measured at S-331 will be compared to the rainfall at S-331 during this Field Test.

~~F.G.~~ Water quality sampling and analysis will be performed to assess water quality conditions associated with the Field Test.

~~G.H.~~ During the Field Test, the effect of the water management operating criteria on water levels in the 8.5 SMA detention cell/STA and the western portion of 8.5 SMA will be assessed for determination of the implementable extent of G-3273 modification/removal (G-3273 target stage from 6.8 feet up to 7.5 feet).

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**Table 3**

**G-3273 Constraint Relaxation/S-356 Field Test  
Surface Water Hydrologic Monitoring**

| <b><u>Feature</u></b> | <b><u>Parameter</u></b>     | <b><u>Purpose</u></b>                      | <b><u>Performance Measure</u></b> |
|-----------------------|-----------------------------|--|-----------------------------------|
| S-333                 | HW, TW, Q                   | Determine volume                           | B, C, D                           |
| S-334                 | HW, TW, Q                   | Determine volume                           | B, C, D, H                        |
| S-336                 | HW, TW, Q                   | Determine volume                           | B, C, D                           |
| S-355A                | HW, TW, Q                   | Determine volume                           | B, C, D                           |
| S-355B                | HW, TW, Q                   | Determine volume                           | B, C, D                           |
| S-356                 | HW, TW, Q                   | Determine volume                           | B, C, D, H                        |
| G-3273                | Stage                       | Determine duration, recession rate         | B, C, D, E                        |
| C-358                 | Stage                       | <u>Staff gage for western end of C-358</u> |                                   |
| S-357N                | HW, TW, Q                   | Determine volume, frequency of use         | B, C, D, E                        |
| S-357                 | HW, TW, Q                   | Determine volume, frequency of use         | B, C, D, E                        |
| S-331                 | HW, TW, Q,<br>Precipitation | Determine volume, frequency of use         | B, C, D, E, F                     |
| S-338                 | HW, TW, Q                   | Determine volume, frequency of use         | B, D                              |
| G-3574                | Stage                       | Determine duration, recession rates        | B, C, D, E                        |
| G-3576                | Stage                       | Determine duration, recession rates        | B, C, D, E                        |
| G-3577                | Stage                       | Determine duration, recession rates        | B, C, D, E                        |
| G-3578                | Stage                       | Determine duration, recession rates        | B, C, D, E                        |
| G-3272                | Stage                       | Determine duration, recession rates        | B, C, D, E                        |
| G-596                 | Stage                       | Determine duration, recession rates        | B, C, D, E, F                     |
| G-3626                | Stage                       | Determine duration, recession rates        | B, C, D, E, F                     |
| G-3627                | Stage                       | Determine duration, recession rates        | B, C, D, E, F                     |
| G-3628                | Stage                       | Determine duration, recession rates        | B, C, D, E, F                     |
| LPG1                  | Stage                       | Determine duration, recession rates        | B, C, D, E, F                     |
| LPG2                  | Stage                       | Determine duration, recession rates        | B, C, D, E, F                     |
| LPG3                  | Stage                       | Determine duration, recession rates        | B, C, D, E, F                     |
| LPG5                  | Stage                       | Determine duration, recession rates        | B, C, D, E, F                     |
| LPG7                  | Stage                       | Determine duration, recession rates        | B, C, D, E, F                     |
| LPG8                  | Stage                       | Determine duration, recession rates        | B, C, D, E, F                     |
| NE1                   | Stage                       | Determine duration, recession rates        | C, E                              |
| NE2                   | Stage                       | Determine duration, recession rates        | C, E                              |
| NE4                   | Stage                       | Determine duration, recession rates        | C, E                              |
| G-3557                | Stage                       | Determine duration, recession rates        | C, D, E                           |
| G-3558                | Stage                       | Determine duration, recession rates        |                                   |

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Notes: HW – Headwater stage; TW – Tailwater stage; Q – Discharge (cfs)<sup>4</sup>

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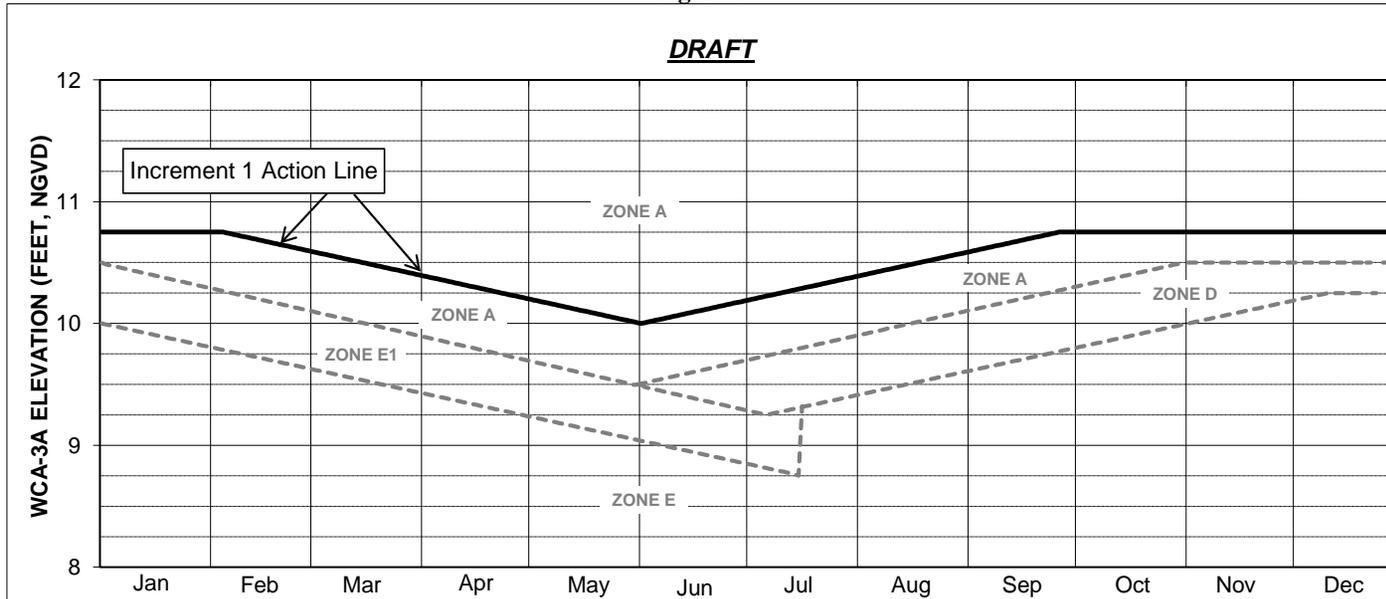
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**Figure 1**

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**NOTES:**

WCA-3A Elevation is the average of Sites 63, 64, and 65.

Increment 1 Action Line is not part of the 2012 WCA-3A Interim Regulation Schedule.

For ease of reference, Increment 1 Action Line is shown with the 2012 WCA-3A Interim Regulation Schedule Zones.

Increment 1 Action Line to be referenced as indicated in the G-3273 Constraint Relaxation/S-356 Field Test and S-357N Operational Strategy.

CENTRAL AND SOUTHERN FLORIDA PROJECT

**G-3273 Constraint Relaxation/S-356  
Field Test and S-357N  
Operational Strategy**

**Increment 1 Action Line**

DATED: August 2014  
US ARMY ENGINEER DISTRICT  
JACKSONVILLE, FLORIDA

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**Figure 21**

**G-3273 Constraint Relaxation and S-356 Field Test  
Surface Water Hydrologic Monitoring Gage Locations**



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Placeholder to be addressed by WQ Sub-team :

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The G-3273 Constraint Relaxation/S-356 Field Test (Increment 1) is a separate and parallel action from the Everglades Restoration Transition Plan (ERTP), which is the successor of the Interim Operational Plan for Protection of the Cape Sable Seaside Sparrow (IOP) 2006. ERTP was implemented in October 2012. The water management operations contained in Increment 1 will be implemented over the period from early 2015 (February/March) through early 2016 (February/March). If weather or other system conditions during this one-year period do not provide sufficient data for a conclusive Field Test, or if the required real estate acquisitions along the

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Note: All elevations are in feet, NGVD of 1929 unless otherwise stated.

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Tamiami Trail necessary to allow higher maximum stages in L-29 for Increment 2 have not been completed the Field Test may be extended up to one-year for a maximum of two-years.

The intent of this operational strategy is to utilize S-333 and S-356 as the primary structures to best achieve the Increment 1 objectives while maintaining the objectives of ERTTP. The 2012 WCP, including the WCA-3A Regulation Schedule, Rainfall Plan, and the Interim Operating Criteria for the 8.5 SMA Project will continue to govern water management operations during Increment 1, with the exception of operating criteria for S-333, S-334, S-356, S-197, and S-357N as shown in the below operational strategy for use during the Field Test. Data will be analyzed during and after Increment 1 as described in the Analysis and Performance Measures section included below.

Increment 1 will maintain the current operating limit constraint of 7.5 feet in L-29, while no longer having a G-3273 constraint for S-333, and utilizing S-356 for control of the seepage to the L-31N Canal. It is anticipated that during Increment 1, the combined flows through S-333 and S-356 will be more than what would have been discharged through these features under ERTTP operations. Additionally, it is expected that during implementation of water management operations associated with Increment 1 under typical conditions, the combined flows through S-173 and S-331 to the C-111 Basin will be less than what would have been discharged through these features under ERTTP operations.

The G-3273 stage constraint will be removed, with system conditions being continuously monitored and operational adjustments made as needed for the duration of the Field Test. S-333 and S-356 will be utilized as indicated in the below operational strategy during the Field Test. If available for use, S-355A and S-355B may also be utilized to discharge to the L-29 canal as indicated in the 2012 WCP.

### S-333 AND S-356 OPERATIONAL STRATEGY

During Increment 1, the L-29 Canal (L-29) will be managed to prevent a sustained stage above 7.5 feet (average of S-333 tailwater and S-334 headwater), which is the maximum operating stage intended within the 2012 WCP (ERTTP). This will be achieved by stopping inflow into L-29 when the L-29 stage rises above 7.5 feet NGVD. The operational guidance listed below will be followed, **The operation of S-197 will terminate with the completion of construction associated with Contracts 8 & 9.**

- 1) **Year-round when stage at G-3273 is below 6.8 and WCA-3A stage is below the Increment 1 Action Line (Figure 1):** (S-333 has priority; S-356 use is secondary to S-333 but S-356 can and should be used subject to L-29 stage limitations)

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Note: All elevations are in feet, NGVD of 1929 unless otherwise stated.

**WORKING DRAFT**

- a) S-333 will be used to release up to the full rate prescribed by Rainfall Plan into NESRS subject only to the L-29 constraint. The combined flow from the S-333, S-12A, S-12B, S-12C, S-12D should not exceed the total prescribed by the Rainfall Plan except as allowed by the ERTTP adaptive language..
  - b) S-356 will be used to control the stage in L-31N between 5.5 and 5.8 feet NGVD to the extent there is capacity in L-29 without reducing the ability to release the full allocation through S-333. Compliance with the range limits is based on the daily average stage at S-356/S-336. The SFWMD has full latitude to turn pumps On an Off within this range. Using S-356 to maintain the L-31N Canal range to 5.5 to 5.8 feet NGVD allows the flexibility to keep G-211 and S-338 closed or reduce G-211 and S-338 discharge if conditions make this desirable. .
  - c) Excess flow from L-30 through S-335 may be diverted into NESRS using S-356 if desired by the agencies. When S-335 HW is above 6.0 the SFWMD has full latitude to make the S-335 discharge required to maintain the stage in L-30 and also providing S-335 discharge to reduce cycling at S-356.
- 2) **Year-round when stage at G-3273 is above 6.8 and the WCA-3A stage is below the Increment 1 Action Line (Figure 1):**
- a) S-333 will be used to release up to the full rate of the Rainfall Plan into NESRS subject to the L-29 constraint and an assured minimum available capacity of 250 cfs through S-356. The combined flow from the S-333, S-12A, S-12B, S-12C, S-12D should not exceed the total prescribed by the Rainfall Plan.
  - b) S-356 will be used to control the stage in L-31N between 5.5 and 5.8 feet NGVD with an assured minimum available capacity of 250 cfs through S-356 (S-356 limited priority over S-333), subject only to the L-29 constraint. Compliance with the range limits is based on the daily average stage at S-356/S-336. The SFWMD may turn pumps On an Off within this range. Using S-356 to maintain the L-31N Canal between 5.5 and 5.8 feet NGVD allows the flexibility to keep G-211 and S-338 closed or reduce G-211 and S-338 discharge if conditions make this desirable.
- 3) **When G-3273 is above 6.8 and when the WCA-3A stage is above the Increment 1 Action Line (Figure 1) from 1 November through 14 July (CSSS Closure Period) (S-333 has priority)**
- a) S-356 is not operated.
  - b) S-333 makes maximum releases to NESRS subject to L-29 constraint
  - c) When L-29 constraint is reached or exceeded and;
    - i) S-12C and S-12D are full open, and
    - ii) the discharge to tide from all of the WCAs are maximized to the extent that downstream condition allow, and
    - iii) the SDCS has available capacity (combined pumping rate at S-332B, S-332C, and S-332D is less than 1125 cfs maintaining stage in the lower half of the range).

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## WORKING DRAFT

- S-334 may be utilized up to a maximum flow rate of 250 cfs to maintain the L-29 canal stage at or below 7.5.
- d) If S-334 is being utilized, C-111 structures (S-332B, S-332C, S-332D, S-176, S-177, S-18C, S-194, and S-196) will be operated according to the 2012 WCP Column 2 criteria and S-338 operated consistent with the 2012 **WCP-ERTP**.
  - e) When the S-18C gate is fully open and S-18C HW exceeds 2.4 S-197 may be operated to release up to a maximum of 200 cfs (daily time-weighted average); When S-18C TW falls below 2.3 for 24 hours, S-197 will be reduce as necessary to bring S-18C HW above 2.3 feet in 24 hours. **The operation of S-197 will revert to normal operations with the completion of construction associated with Contracts 8 & 9.**
- 4) When G-3273 is above 6.8, and the WCA-3A stage is above the Increment 1 Action Line (Figure 1) **from 15 July through 31 October** (S-333 has priority with no use of S-334)
- a) S-333 makes maximum releases to NESRS subject only to L-29 constraint
  - b) S-356 is not operated and S-334 remains closed.
  - c) C-111 structures (S-332B, S-332C, S-332D, S-176, S-177, S-18C, S-194, and S-196) are operated according to the 2012 WCP Column 2 criteria and S-338 operated consistent with the 2012 WCP-ERTP.
  - d) When the S-18C gate is fully open and S-18C HW exceeds 2.4 S-197 may be operated to release up to a maximum of 200 cfs (daily time-weighted average); When S-18C TW falls below 2.3 for 24 hours, S-197 will be reduce as necessary to bring S-18C HW above 2.3 feet in 24 hours.

## WATER SUPPLY OPERATIONS

No changes to water supply operations are proposed. It is anticipated that water supply deliveries to the SDCS will not be needed when S-356 is pumping. If S-356 is pumping and S-334 and/or S-335 are to be utilized to deliver water supply to SDCS, then S-356 will stop pumping, as stated above.

## OPERATIONAL STRATEGY FOR 8.5 SQUARE MILE AREA

Consistent with the 2011 Proposed Interim Operating Criteria for the 8.5 Square Mile Area Environmental Assessment and the 2012 WCP, water management operations at S-331 and S-357 during Increment 1 will fall within distinct ranges dependent on water conditions (stages) assessed by Las Palmas Groundwater Gage 2 (LPG2) and C-357 measured at the Las Palmas Canal Gage 1 (LPC1) or S-357 headwater (S357HW). S-357 will have pumping constraints based on the average-daily, north to south groundwater gradient (DELTA) between Angel's Well water level and the Las Palmas Groundwater Gage 1 (LPG1) water level. The S-357 pump station will be operated for the purpose of providing flood mitigation for the 8.5 SMA. S-357 will be operated to maintain an average-daily water level in C-357 at LPC1 or S357 headwater (HW) between 5.7 to 6.2 feet-NGVD (National Geodetic Vertical Datum of

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Note: All elevations are in feet, NGVD of 1929 unless otherwise stated.

## WORKING DRAFT

1929).

During Increment 1 S-331 will be used to 1) provide flood damage reduction for the lands located along the east side of the L-31N Canal, 2) convey excess water from WCA-3A to the C-111 Detention Areas and the C-111 Canal as required by Column 2 operation under the Interim Operation Plan for Protection of the Cape Sable Seaside Sparrow, 3) provide water supply to Taylor Slough, the L-31N, and C-111 Canals, and 4) act as a partial or complete replacement to S-357 should mechanical, permitting issues or seepage impacts limit or preclude the use of S-357.

S-331 will be operated using four pumping ranges: “high”, “middle”, “low” and “low adjustment”, based on LPG2 and S-357 operational ability. S-331/S-173 operations will be triggered based on the S-331 HW elevation. The intent is to have S-357 provide the drainage authorized by the 8.5 SMA 2000 GRR while maintaining or improving the hydroperiods of the wetlands along the west side of the 8.5 SMA protection levee. Only a portion of the S-357 capacity can be used due to the limited infiltration rate provided by the 8.5 SMA’s small detention cell and the inability to overflow this detention cell. Due to the limited pumping capacity at S-357 it is expected that, at times, this capacity will be insufficient to maintain the C-357 Canal at target stages. During these time periods the S-331 operational range will be lowered to assist S-357 in maintaining drainage.

The 2012 WCP does not contain water management operating criteria for the planned spillway (S-357N) located in the 8.5 SMA upstream of S-357, at the intersection of C-357 and the newly constructed seepage collection canal (C-358). The 2012 Design Refinement for the 8.5 SMA Environmental Assessment did not address water management operating criteria for S-357N or C-358 and stated that all gates would be in the closed position until a new operational protocol is developed for the Modified Water Deliveries to Everglades National Park Project. ***Proposed S-357N interim water management operating criteria for utilization during the G-3273 Constraint Relaxation/S-356 Field Test will be developed through coordination with the technical sub-team.***

The testing protocol for S-357N will be designed to establish the operating criteria for S-357N. A newly installed staff gage at the western end of C-358 will be observed during S-357 pumping. The testing protocol for S-357N will be an iterative approach consisting of 4 to 5 weeks of gate changes during the wet season. The S-357N gate changes will be meant to stress the system.

Paul to provide additional scenarios for S-357N operating criteria

### ANALYSIS & PERFORMANCE MEASURES

***[ The monitoring and evaluation methodology for utilization during the G-3273 Constraint Relaxation/S-356 Increment 1 Field Test will be developed through coordination with the technical sub-team ]***

- A. A monitoring and assessment plan has been developed.
- B. The list of gages to be used for the analysis is shown in Table 3. A map of the gages and structures is shown in Figure 1.

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Note: All elevations are in feet, NGVD of 1929 unless otherwise stated.

**WORKING DRAFT**

- C. Post-Field Test, data analysis to quantify seepage into L-31N and identify the zone of influence for hydrologic effects.
- D. Post-Field Test, comparison of the volume of water sent to NESRS (S-333, S-355A, S-355B, S-356) during this Field Test (G-3273 above 6.8 feet) to the historical volume (G-3273 above 2012 WCP constraint of 6.8 feet) of water that was sent to NESRS (S-333, S-355A, S-355B).
- E. Post-Field Test, comparison of the volume of water sent to the 8.5 SMA detention cell/ Stormwater Treatment Area (STA) (S-357) and L-31N/C-1W (S-331, S-338) during this Field Test (G-3273 above 6.8 feet) to the historical volume (G-3273 above 2012 WCP constraint of 6.8 feet) of water that was sent to L-31N/C-1W (S-331, S-338).
- F. Post-Field Test, the historic rainfall as measured at S-331 will be compared to the rainfall at S-331 during this Field Test.
- G. Water quality sampling and analysis will be performed to assess water quality conditions associated with the Field Test.
- H. During the Field Test, the effect of the water management operating criteria on water levels in the 8.5 SMA detention cell/STA and the western portion of 8.5 SMA will be assessed for determination of the implementable extent of G-3273 modification/removal (G-3273 target stage from 6.8 feet up to 7.5 feet).

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Note: All elevations are in feet, NGVD of 1929 unless otherwise stated.

**WORKING DRAFT**

**Table 3**

**G-3273 Constraint Relaxation/S-356 Field Test  
Surface Water Hydrologic Monitoring**

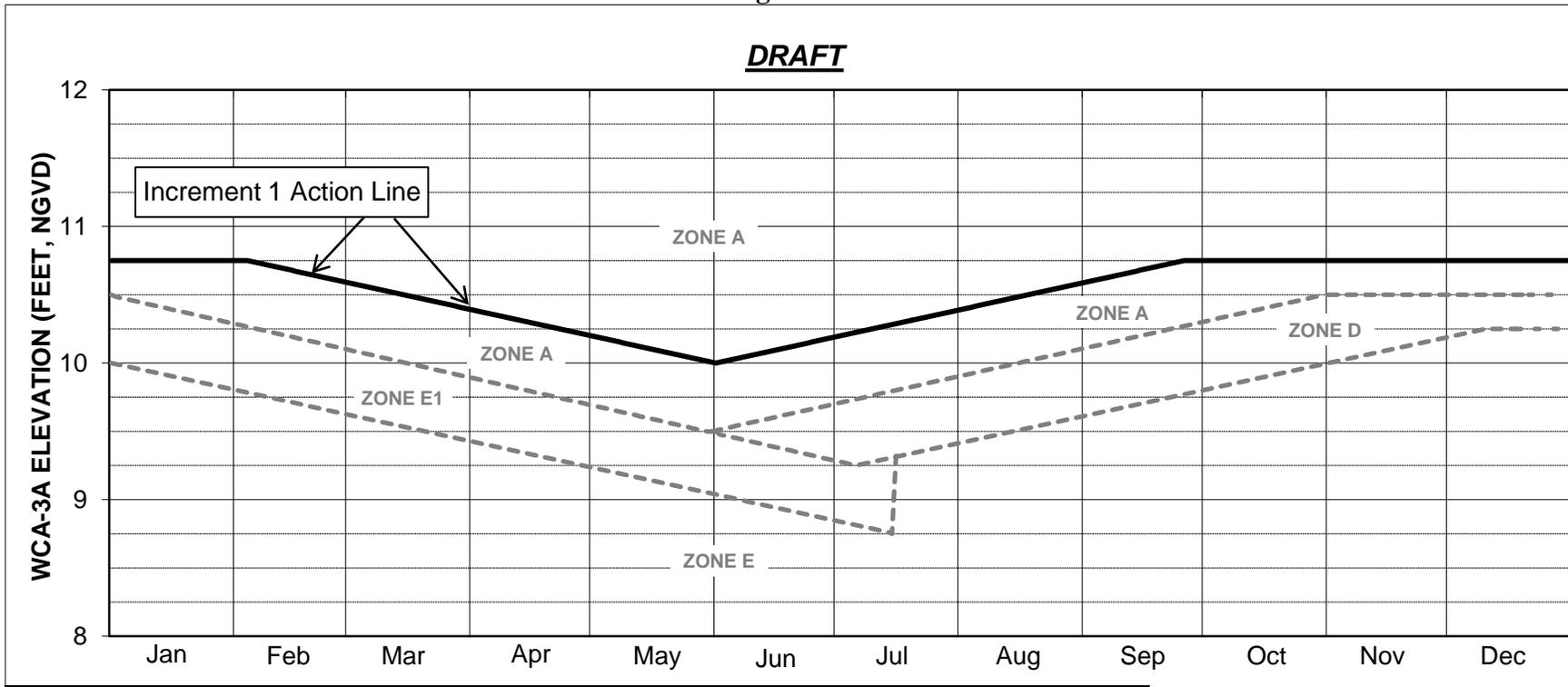
| <b>Feature</b> | <b>Parameter</b>            | <b>Purpose</b>                      | <b>Performance Measure</b> |
|----------------|-----------------------------|-------------------------------------|----------------------------|
| S-333          | HW, TW, Q                   | Determine volume                    | B, C, D                    |
| S-334          | HW, TW, Q                   | Determine volume                    | B, C, D, H                 |
| S-336          | HW, TW, Q                   | Determine volume                    | B, C, D                    |
| S-355A         | HW, TW, Q                   | Determine volume                    | B, C, D                    |
| S-355B         | HW, TW, Q                   | Determine volume                    | B, C, D                    |
| S-356          | HW, TW, Q                   | Determine volume                    | B, C, D, H                 |
| G-3273         | Stage                       | Determine duration, recession rate  | B, C, D, E                 |
| C-358          | Stage                       | Staff gage for western end of C-358 |                            |
| S-357N         | HW, TW, Q                   | Determine volume, frequency of use  | B, C, D, E                 |
| S-357          | HW, TW, Q                   | Determine volume, frequency of use  | B, C, D, E                 |
| S-331          | HW, TW, Q,<br>Precipitation | Determine volume, frequency of use  | B, C, D, E, F              |
| S-338          | HW, TW, Q                   | Determine volume, frequency of use  | B, D                       |
| G-3574         | Stage                       | Determine duration, recession rates | B, C, D, E                 |
| G-3576         | Stage                       | Determine duration, recession rates | B, C, D, E                 |
| G-3577         | Stage                       | Determine duration, recession rates | B, C, D, E                 |
| G-3578         | Stage                       | Determine duration, recession rates | B, C, D, E                 |
| G-3272         | Stage                       | Determine duration, recession rates | B, C, D, E                 |
| G-596          | Stage                       | Determine duration, recession rates | B, C, D, E, F              |
| G-3626         | Stage                       | Determine duration, recession rates | B, C, D, E, F              |
| G-3627         | Stage                       | Determine duration, recession rates | B, C, D, E, F              |
| G-3628         | Stage                       | Determine duration, recession rates | B, C, D, E, F              |
| LPG1           | Stage                       | Determine duration, recession rates | B, C, D, E, F              |
| LPG2           | Stage                       | Determine duration, recession rates | B, C, D, E, F              |
| LPG3           | Stage                       | Determine duration, recession rates | B, C, D, E, F              |
| LPG5           | Stage                       | Determine duration, recession rates | B, C, D, E, F              |
| LPG7           | Stage                       | Determine duration, recession rates | B, C, D, E, F              |
| LPG8           | Stage                       | Determine duration, recession rates | B, C, D, E, F              |
| NE1            | Stage                       | Determine duration, recession rates | C, E                       |
| NE2            | Stage                       | Determine duration, recession rates | C, E                       |
| NE4            | Stage                       | Determine duration, recession rates | C, E                       |
| G-3557         | Stage                       | Determine duration, recession rates | C, D, E                    |
| G-3558         | Stage                       | Determine duration, recession rates |                            |

Notes: HW – Headwater stage; TW – Tailwater stage; Q – Discharge (cfs)<sup>4</sup>

Note: All elevations are in feet, NGVD of 1929 unless otherwise stated.

**WORKING DRAFT**

**Figure 1**



**NOTES:**

WCA-3A Elevation is the average of Sites 63, 64, and 65.

Increment 1 Action Line is not part of the 2012 WCA-3A Interim Regulation Schedule.

For ease of reference, Increment 1 Action Line is shown with the 2012 WCA-3A Interim Regulation Schedule Zones.

Increment 1 Action Line to be referenced as indicated in the G-3273 Constraint Relaxation/S-356 Field Test and S-357N Operational Strategy.

CENTRAL AND SOUTHERN FLORIDA PROJECT

**G-3273 Constraint Relaxation/S-356  
Field Test and S-357N  
Operational Strategy**

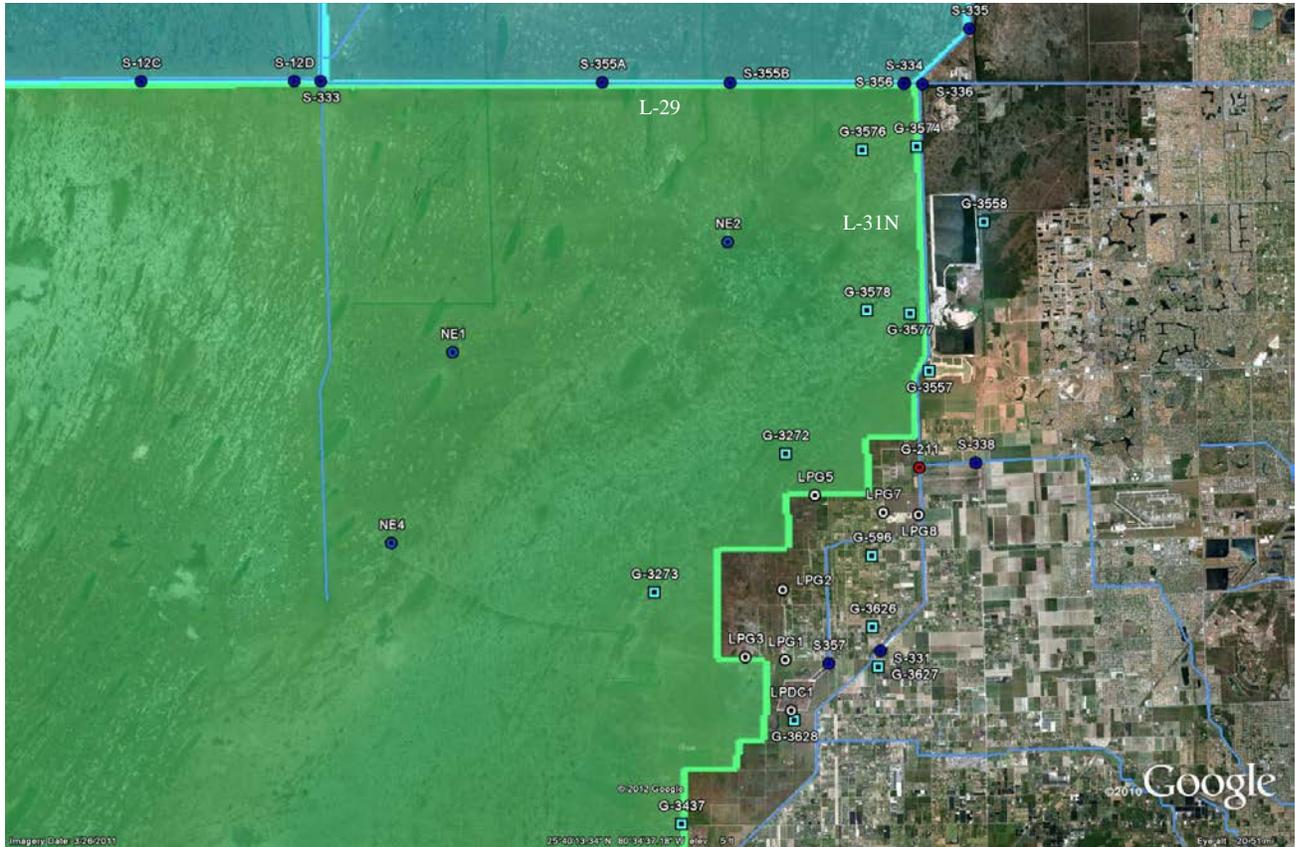
**Increment 1 Action Line**

DATED: August 2014  
US ARMY ENGINEER DISTRICT  
JACKSONVILLE, FLORIDA

Note: All elevations are in feet, NGVD of 1929 unless otherwise stated.

**Figure 2**

**G-3273 Constraint Relaxation and S-356 Field Test  
Surface Water Hydrologic Monitoring Gage Locations**



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Note: All elevations are in feet, NGVD of 1929 unless otherwise stated.