santee cooper®

# Closure Plan Narrative for Winyah Generating Station's New Class 3 CCR Landfill Area 1

40 CFR Part 257
Operating Criteria
§257.1 02(b)

**CONTENTS**



Revision and Copy Control

| Revision No. | Date | Reason for Change |
|---|---|---|
| 0 | November 1, 2018 | Original document created to comply with CCR Rule |
| 1 | August 9, 2021 | Addition of Appendix B which is supplemental to the original closure plan to provide details for an alternative final cover. The Discussion section in the narrative below has been updated to reflect this addition. |

# 1. INTRODUCTION

The United States Environmental Protection Agency (EPA) promulgated regulations (40 CFR Part 257) regarding coal combustion residuals (CCRs). The CCR rule was published in the Federal Register on April 17, 2015 and became effective on October 19, 2015. The Class Three CCR Landfill is subject to the CCR Rule as a new landfill as defined in 40 CFR §257.53. A requirement of the CCR rule is to prepare a written closure plan (§257.102(b)) for new CCR landfills. This plan must be placed in the facility operating record no later than the date of the initial receipt of CCR in the CCR unit as required by §257.102(b)(2)(ii). The owner or operator may amend the initial or any subsequent written closure plan at any time per §257.102(b)(3)(i).

This document serves as certification that the written closure plan for the new CCR landfill Area 1 at Winyah Generating Station in Georgetown, South Carolina meets the requirements of §257.102(b). The closure plan is documented in the Winyah Generating Station Class Three Landfill Permit Application approved by the South Carolina Department of Health and Environmental Control (DHEC) on 15 September 2017 (Permit #LF3-00042). The written closure plan meets the requirements of the South Carolina solid waste management regulation R.61-107.19 as certified by the design engineer-of-record, Scott M. Graves, P.E., Geosyntec Consultants, Inc and is provided as Appendix A. The South Carolina Department of Health and Environmental Control issued a permit to construct on September 15, 2017 with an effective date of September 30, 2017. A closure plan supplement for an alternative final cover option was prepared and certified by the design engineer-of-record, Scott M. Graves, P.E., Geosyntec Consultants, Inc and is provided as Appendix B. The South Carolina Department of Health and Environmental Control issued approval for this alternative final cover system on September 4, 2020.

# 2. DISCUSSION

Title 40 CFR §257.102(b)(l) requires that the owner or operator of a CCR unit must prepare a written closure plan that describes the steps necessary to close the CCR unit at any point during the active life of the CCR unit consistent with recognized and generally accepted good engineering practices. The written closure plan must include, at a minimum the information listed below:

*257.102(b)(1)(i) A narrative description of how the CCR unit will be closed in accordance with this section*

Refer to Section 5 of Appendix A for a narrative description of how the new Class Three CCR Landfill Area 1 will be closed. In general, the final cover system will be installed in phases as CCR waste placement reaches threshold elevations that generally correspond to each bench elevation. Over time, this phased approach will reduce the exposed surface of the waste, reduce the leachate generation, and minimize the remaining area to be closed upon final receipt of waste.

*257.102(b)(1)(ii) If the closure of the CCR unit will be accomplished through removal of CCR*

*from the CCR unit, a description of the procedures to remove the CCR and decontaminate the CCR unit in accordance with paragraph (c) of this section*

The above requirement is not applicable, as the closure will not be accomplished by removal of CCR.

*257.102(b)(1)(iii) If closure of the CCR unit will be accomplished by leaving CCR in place, a description of the final cover system, designed in accordance with paragraph (d) of this section, and the methods and procedures to be used to install the final cover. The closure plan must also discuss how the final cover system will achieve the performance standards specified in paragraph (d) of this section*

Paragraph (d) of this section (§257.102(d)(1) through (3)) specifies the minimum performance standards for closure when leaving CCR in place, including:

(1) The owner or operator of a CCR unit must ensure that, at a minimum, the CCR unit is closed in a manner that will:

*(1)(i) Control, minimize or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste and releases of CCR, leachate, or contaminated run-off to the grounds or surface waters or to the atmosphere;*

Per Sections 2 of Appendices A & B, all final cover system alternatives are designed to provide a maximum permeability less than or equal to the bottom liner system of the landfill, to minimize stormwater infiltration through the closed landfill, and to resist erosive forces. This will minimize post-closure infiltration of liquids into the waste and releases of CCR, leachate, or contaminated run-off to the ground or surface waters or to the atmosphere.

*(1)(ii) Preclude the probability of future impoundment of water, sediment, or slurry;*

Per Section 2 of Appendix A, the final cover system shall promote positive drainage with final design grades of the top surface inclined at a nominal 3 to 5 percent slope. This will prevent the impoundment of water, sediment, or slurry. Per Section 5 of Appendix B, the alternative final cover option provides equivalent hydraulic barrier performance to the standard final cover system.

*(1)(iii) Include measures that provide for major slope stability to prevent the sloughing or movement of the final cover system during the closure and post-closure care period:*

Per Section 2 of Appendix A, the side slopes will not exceed three horizontal feet to one vertical foot (3H:1V). Furthermore, slope stability analyses have been performed on

the permitted final cover system described in this closure plan (including all system components and the maximum side slopes) to ensure that sloughing or movement of the final cover system will not occur during the closure and post- closure care periods. Per Section 5 of Appendix B, the alternative final cover option provides equivalent erosion resistance performance to the standard final cover system.

*(1)(iv) Minimize the need for further maintenance of the CCR unit:*

Per Section 2 of Appendix A, the uppermost component of the Standard Final Cover System includes a soil layer capable of supporting native vegetation. Per Section 2 of Appendix B, the uppermost component of the alternative ClosureTurf® Final Cover System includes an engineered-turf protective layer consisting of high-density polyethylene grass blades adhered to a woven geotextile backing ballasted with a thin layer of sand infill. Both of these components will minimize erosion of waste CCR material and therefore minimize the amount of further maintenance required.

*(1)(v) Be completed in the shortest amount of time consistent with recognized and generally accepted good engineering practices.*

Per Section 5 of Appendix A, the final cover system will be installed in phases to minimize the time required to complete closure upon the final receipt of waste. Per Section 5.7 of Appendix A, closure must be completed must be completed within 180 days.

(2) *Drainage and Stabilization of CCR surface impoundments.* The owner or operator of a CCR surface impoundment or any lateral expansion of a CCR surface impoundment must meet the requirements of paragraphs (d)(2)(i) and (ii) of this section prior to installing the final cover system required under paragraph (d)(3) of this section.

The above requirement is not applicable, as the existing Class Three CCR Landfill Area 1 is not a surface impoundment.

(3) *Final cover system.* If a CCR unit is closed by leaving CCR in place, the owner or operator must install a final cover system that is designed to minimize infiltration and erosion, and at a minimum, meets the requirements of paragraph (d)(3)(i) of this section, or the requirements of the alternative final cover system specified in paragraph (d)(3)(ii) of this section.

*(3)(i) The final cover system must be designed and constructed to meet the criteria in paragraphs (d)(3)(i)(A) through (D) of this section. The design of the final cover system must be included in the written closure plan required by paragraph (b) of this section.*

*(A) The permeability of the final cover system must be less than or equal to the*

*permeability of any bottom liner system or natural subsoils present, or a permeability no greater than 1 x $10^{-5}$ cm/sec, whichever is less*

Per Section 2 of Appendix A, final cover system Option 1 (Standard Final Cover System) will provide a maximum permeability less than or equal to the bottom liner system. The Standard Final Cover System will have a permeability less than 1 x $10^{-5}$ cm/sec.

*(B) The infiltration of liquids through the closed CCR unit must be minimized by the use of an infiltration layer that contains a minimum of 18 inches of earthen material*

Per Section 2 of Appendix A, the Standard Final Cover System satisfies this requirement.

*(C) The erosion of the final cover system must be minimized by the use of an erosion layer that contains a minimum of six inches of earthen material that is capable of sustaining native plant growth*

Per Section 2 of Appendix A, the uppermost component of the Standard Final Cover System includes an 18-inch thick layer of protective soil and a 6-inch thick layer of topsoil capable of supporting native vegetation.

*(D) The disruption of the integrity of the final cover system must be minimized through a design that accommodates settling and subsidence*

Per Section 2 of Appendix A, post-closure differential settlement is not anticipated with this waste mass because it consists of compacted CCR material. The integrity of the Standard Final Cover System will not be disrupted due to settling or subsidence.

*(3)(ii) The owner or operator may select an alternative final cover system design, provided the alternative final cover system is designed and constructed to meet the criteria in paragraphs (f)(3)(ii)(A) through (B) of this section. The design of the final cover system must be included in the written closure plan required by paragraph (b) of this section.*

*(A) The design of the final cover system must include an infiltration layer that achieves an equivalent reduction in infiltration as the infiltration layer specified in paragraphs (d)(3)(i)(A) and (B) of this section*

Per Section 5 of Appendix A, the final cover system Option 2 (Alternate Final Cover System) will provide a maximum permeability less than or equal to the bottom liner system. The Alternate Final Cover System will have a permeability less than 1 x $10^{-5}$ cm/sec and meet or exceed the performance of the Standard Final Cover System.

Per Section 5 of Appendix B, alternative final cover system Option 3 (ClosureTurf® Final Cover System) will provide a maximum permeability less than or equal to the bottom liner system. The ClosureTurf® Final Cover System will have a permeability less than 1 x $10^{-5}$ cm/sec and meet or exceed the performance of the Standard Final Cover System.

*(B) The design of the final cover system must include an erosion layer that provides equivalent protection from wind or water erosion as the erosion layer specified in paragraph (d)(3)(i)(C) of this section.*

Per Section 2 of Appendix A, the upper-most component of the Option 2 Alternate Final Cover System includes an 18-inch thick layer of protective soil and a 6-inch thick layer of topsoil capable of supporting native vegetation.

Per Section 5 of Appendix B, the ClosureTurf® Final Cover System includes an engineered-turf protective layer consisting of high-density polyethylene grass blades adhered to a woven geotextile backing ballasted with a thin layer of sand infill. This system was demonstrated to be functionally equivalent to a standard final cover system consisting of six inches of earthen material and native vegetation with respect to erosion protection. Therefore, this requirement is met.

*(C) The disruption of the integrity of the final cover system must be minimized through a design that accommodates settling and subsidence*

Per Section 2 of Appendix A, post-closure differential settlement is not anticipated with this waste mass because it consists of compacted CCR. The integrity of the either Alternate Final Cover System or the ClosureTurf® Final Cover System will not be disrupted due to settling or subsidence.

*(3)(iii) The owner or operator of the CCR unit must obtain a written certification from a qualified professional engineer that the design of the final cover system meets the requirement of this section*

Refer to Section 4 of this document.

*257.102(b)(1)(iv) An estimate of the maximum inventory of CCR ever on-site over the active life of the CCR unit.*

Per Section 4 of Appendix A, an estimate of the maximum inventory of CCR ever on-site in Landfill Area 1 is 2,191,000 cubic yards.

*257.102(b)(1)(v) An estimate of the largest area of the CCR unit ever requiring a final cover as required by paragraph (d) of this section at any time during the CCR unit's active life.*

Per Section 3 of Appendix A, an estimate of the largest area of Landfill Area 1 ever requiring a final cover is 31.3 acres. Because the landfill will be closed in phases, this is likely a conservative estimate of the maximum area.

*257.102(b)(1)(vi) A schedule for completing all activities necessary to satisfy the closure criteria in this section, including an estimate of the year in which all closure activities for the CCR unit will be completed. The schedule should provide sufficient information to describe the sequential steps that will be taken to close the CCR unit, including identification of major milestones such as coordinating with and obtaining necessary approvals and permits form other agencies, the dewatering and stabilization phases of CCR surface impoundment closure, or installation the final cover system, and the estimated timeframes to complete each step or phase of CCR unit closure. When preparing the written closure plan, if the owner or operator of a CCR unit estimates that the time required to complete closure will exceed the timeframes specified in paragraph (f)(1) of this section, the written closure plan must include the site- specific information, factors and consideration that would support any time extension sought under paragraph (f)(2) of this section.*

For the purpose of this section, the schedule for completing closure is based on the permitted maximum annual CCR waste placement rate, which is 2,777,800 cubic yards. This maximum annual tonnage limit is based on the facility's design capacity (2,191,000 cubic yards), operational capacity, and expected operational life. The actual annual waste placement rate may be less, which will result in a later closure date.

Landfill Area 1 began receiving waste on or after November 1, 2018. The final cover system is anticipated to be installed in three (3) phases which is dependent on the filling rate discussed above. The first phase of closure will be initiated in the fourth quarter of 2021. The final phase of closure is anticipated to be initiated in 2024. On this basis, the schedule for completing all activities necessary to satisfy the closure criteria in this section is outlined in the table below. The first four entries apply to each partial closure increment and all entries apply to final closure:

| EVENT | TIMEFRAME |
|---|---|
| Notify SC DHEC of intent to close a given increment | Just prior to receipt of final wastes within that area |
| Prepare closure construction plans, obtain bids, and select contractor | 90 days following provision of SC DHEC notice |
| Construct final cover system | Within 180 days following initiation of construction |
| Submit closure certification to SC DHEC | 60 days following construction of each increment |
| Place notation on the deed to the landfill facility property that the land was used as a landfill and that its use is restricted | 30 days following SC DHEC issuance of landfill facility final closure |

# 3. CONCLUSIONS

The existing permitted closure plan for the new Class Three CCR Landfill Area 1 at Winyah Generating Station in Georgetown, South Carolina, and supplemental information included in this report, satisfy the written closure plan requirements outlined in Title 40 CFR §257.102.

## 4. CERTIFICATION

**Certification for Closure Plan**

**Federal CCR Rule: 40 CFR §257.102**

**CCR Unit: WGS Class Three Landfill Area 1 – New CCR Landfill**

I, the undersigned Professional Engineer registered in good standing in the State of South Carolina, do hereby certify under penalty of law that I have personally examined and am familiar with the information submitted in this demonstration, and that, based on my inquiry of the individuals responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. I certify, for the above-referenced CCR Unit, that the written closure plan contained herein is in accordance with the requirements of Title 40 CPR §257.102, and that the proposed design of the final cover system meets the requirements of Title 40 CPR §257.102(d)(3).

Seal and Signature: 

8/9/2021

Printed Name: Aubree Decoteau

P.E. License Number 35800 State of South Carolina

# APPENDIX A

## Permitted Closure Plan

*Prepared for*

**Santee Cooper Power**
1 Riverwood Drive
Moncks Corner, South Carolina 29461

# CLOSURE PLAN

## WINYAH GENERATING STATION
## PERMIT APPLICATION
## NON-COMMERCIAL CLASS THREE LANDFILL
## Georgetown, South Carolina

*Prepared by*

Geosyntec consultants

engineers | scientists | innovators

104 South Main Street, Suite 115
Greenville, South Carolina 29601

SOUTH CAROLINA
GEOSYNTEC CONSULTANTS, INC.
No. 773
CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA
LICENSED PROFESSIONAL ENGINEER
No. 33535
SCOTT M. GRAVES
8/9/2016

Project Number GSC5242

August 2016

# TABLE OF CONTENTS



SOUTH CAROLINA LICENSED PROFESSIONAL ENGINEER No. 33535 SCOTT M. GRAVES 8/9/2016

SOUTH CAROLINA GEOSYNTEC CONSULTANTS, INC. No. 773 CERTIFICATE OF AUTHORIZATION

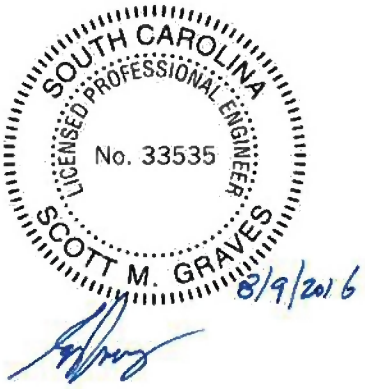
## TABLE OF CONTENTS (Continued)

## LIST OF TABLES



## ATTACHMENT






# 1. INTRODUCTION

## 1.1 Terms of Reference

This Closure Plan (Plan) has been prepared by Geosyntec Consultants (Geosyntec) for the Class Three Landfill at Santee Cooper's Winyah Generating Station (WGS) located in Georgetown County, South Carolina. Geosyntec prepared this Plan on behalf of the permit applicant – the South Carolina Public Service Authority doing business as (d.b.a.) Santee Cooper (Santee Cooper). The Class Three Landfill will be composed of two areas, referred to as "Landfill Area 1" and "Landfill Area 2". Collectively these areas are referred to as the "Class Three Landfill".

Detailed drawings illustrating the Class Three Landfill features including the components described herein are presented on the Engineering Drawings that accompany the permit application.

## 1.2 Purpose of This Closure Plan

This Plan serves as the Closure Plan required for Class Three Landfills by Part V, Subpart H.5.b.(15) of South Carolina Department of Health and Environmental Control (DHEC) Regulation R.61-107.19. The purpose of this Plan is to provide a description of the activities to be performed to satisfy the requirements of Part V, Subpart F, Section 258.60 of R.61-107.19. A closure cost estimate is also included, pursuant to Part I, Section E.1 of R.61-107.19.

Following DHEC approval of this Plan, Santee Cooper will amend this Plan within 60 days prior to a planned change in the operation of the Class Three Landfill that would substantially affect the approved Plan, or no later than 60 days after an unanticipated event necessitates a revision of the approved Plan. Once closure activities have commenced at the Class Three Landfill, amendments to the approved Plan will be completed no later than 30 days following the triggering event. Plan amendments will be certified by a qualified professional engineer and submitted to DHEC for review and approval prior to implementation. Any updates to this Plan, and any monitoring, testing, or analytical data as required by Part V, Subpart F, Section 258.60 of R.61-107.19, will be placed in the Class Three Landfill Operating Record.

## 1.3 Overall Contents of This Closure Plan

The remainder of this Plan provides the following:

- a description of final cover system and the methods and procedures that will be used to install the cover;
- an estimate of the largest area of the Class Three Landfill ever requiring a final cover at any time during the active life;
- an estimate of the maximum inventory of waste ever on-site over the active life of the Class Three Landfill;
- a description of the steps necessary to close all Class Three Landfill areas at any point during their active life, including the closure sequence and schedule of closure milestones, as needed to satisfy the applicable closure criteria.

Additionally, as mentioned the closure cost estimate is presented in Attachment A to this Plan.

# 2. FINAL COVER SYSTEM

## 2.1 Design

The final cover system for the Class Three Landfill is designed to:

- provide long-term minimization of infiltration of precipitation into disposed wastes within the landfill;
- promote drainage while minimizing erosion of final cover soils; and
- function with minimal maintenance over the post-closure period.

Two types of final cover system options are proposed to be allowed: (i) "Option 1", a standard (prescriptive) final cover system for Class Three Landfills having liner systems, and meeting the requirements of Subpart F, Section 258.60.k; and (ii) "Option 2", an alternative composite liner design as allowed by 258.60.b (that has a composite cover barrier infiltration layer that achieves an equivalent reduction in infiltration as the prescribed infiltration layer and thereby meets or exceeds the environmental and public health protection standards). The components of each option are presented below.

Final Cover System – Option 1 (from top to bottom):

- a 2-ft thick layer of soil capable of supporting native vegetation (further subdivided into an upper 6-inch thick topsoil layer and a lower 18-inch thick protective cover soil layer);
- a geocomposite drainage layer (geotextile filters bonded to both sides of a geonet drainage core);
- a flexible membrane liner (FML), which will be a 20-mil (minimum) thick linear low-density polyethylene (LLDPE) geomembrane liner, textured on both sides; and
- an 18-inch thick infiltration layer of compacted soil with a maximum hydraulic conductivity of $1 \times 10^{-5}$ cm/sec and capable of providing a suitable foundation for the FML.

Final Cover System – Option 2 (from top to bottom):

- a 2-ft thick layer of soil capable of supporting native vegetation (further subdivided into an upper 6-inch thick topsoil layer and a lower 18-inch thick protective cover soil layer);
- a geocomposite drainage layer (geotextile filters bonded to both sides of a geonet drainage core);
- a flexible membrane liner (FML), which will be a 20-mil (minimum) thick LLDPE geomembrane liner, textured on both sides; and
- a needlepunched reinforced geosynthetic clay liner (GCL) infiltration layer.

Inspection of the above shows that both final cover system options will use the same components from the FML and above. The alternative final cover system (Option 2) uses a GCL infiltration layer in place of the prescribed (Option 1) 18-inches of low permeability compacted soil infiltration layer.

It is also noted that the final cover system does not include a gas management layer or layers, or other gas management system design. As discussed in the Engineering Report and O&M Plan, the large majority of the wastes that will be disposed of at the facility are coal combustion product (CCP) wastes. The wastes will be non-putrescible and not of a type expected to biodegrade; municipal solid waste will not be accepted. Thus, the composition of the waste that will be disposed at the landfill is not expected to generate methane or other explosive landfill gases.

The landfill cover will have a nominal sideslope of 3 horizontal to 1 vertical (3H:1V) between drainage terraces, and with top surface slopes (top-deck areas) inclined at a nominal 3 to 5 percent slope. Drainage terraces and downdrain pipe features will be constructed to intercept storm water and convey it to the perimeter drainage channels. This drainage terraces are designed to ensure that the hydraulic head at any point in the terrace does not exceed one foot for a 24-hour period as the result of a 24-hr, 25-year storm event.

## 2.2 Construction

Installation of the final cover system shall be performed in accordance with the design presented on the Engineering Drawings and the standards outlined in Technical Specifications pertaining to the final cover components, which are included as part of the permit application. These specifications include the required material properties, as well as construction/installation requirements. Further, third-party construction quality assurance (CQA) shall be performed during final closure in order to ensure that the final cover system is completed in accordance with applicable requirements and as set forth in the CQA Plan included as part of the permit application. The CQA Plan provides the requirements for monitoring, testing, and documenting the materials and construction/installation of the final cover system components.

The materials to be used for construction of the final cover system soil components will be obtained from either on-site and/or off-site borrow areas. The source(s) will be selected based on ability to provide material conforming to project specifications, availability of the required volumes and proximity to the landfill. Appendix B of the Engineering Report provides an estimate of the total landfill final cover surface areas, and resulting estimated final cover system soil quantities.

A schedule of required closure activities, including construction notification and certification, is provided subsequently in Section 5 of this Plan.

## 3. ESTIMATE OF LARGEST AREA REQUIRING FINAL COVER

The Class Three Landfill is composed of two distinct areas (Landfill Area 1 and Landfill Area 2). The final cover system for each area will be constructed incrementally in phases as cells/phases of filling are brought to final grade. Initially, the lower elevations of outer sideslopes of a given area or portion thereof will be brought to final grades and will receive a final cover; followed later by installing final cover on the upper sideslopes, and finally the top deck. In this manner, the maximum area requiring final closure at the Class Three Landfill at any given point in time can be kept to a fraction of the total acreage permitted for landfilling.

The total landfill areas, and an estimate of the largest area of the Class Three Landfill ever requiring final cover at a given time at any time during the active life is summarized below in Table 1.

**Table 1**
**Final Cover Areas**

| Class Three Landfill Area | Total Area (acres) | Largest Area Requiring Final Cover at Any Time (acres) |
|---|---|---|
| Landfill Area 1 | 31.3 | 31.3(1) |
| Landfill Area 2 | 75.3 | 31.0(2) |
| **Total** | **106.6** | 31.3(3) |

Notes:
(1) Largest area of Landfill Area 1 that could require closure at any time is estimated to occur soon after initial operations, when all cells are open and no incremental closures have taken place.
(2) Largest area of Landfill Area 2 that could require closure at any time is estimated to be during the early waste placement activities in Cells 4 and 5, when no incremental closures have taken place.
(3) Landfill Areas 1 and 2 will not have their largest areas open simultaneously. The "Total" largest area value is the larger of the two areas.

A series of landfilling progression drawings are included with the Engineering Drawings that accompany the permit application. These drawings illustrate the approximate phased construction of the Class Three Landfill, and were used to estimate the largest area requiring cover at any time during the active life.

## 4. ESTIMATE OF MAXIMUM INVENTORY OF WASTE

The estimated maximum inventory of wastes ever on-site during the active life of the landfill facility is summarized below in Table 2.

**Table 2**
**Maximum Waste Inventory**

| Class Three Landfill Area | Waste Disposal Volume (CY) |
|---|---|
| Landfill Area 1 | 2,191,000 |
| Landfill Area 2 | 9,684,000 |
| **Total** | **11,875,000** |

Note that these volumes refer to the calculated volume between the top of the protective cover layer component of the liner system vs. the bottom of the final cover system. These values do not include the possible volume of bottom ash which may be used as an allowable material within the 2-ft liner drainage/protective cover layer. A calculation package further describing the volume computations is provided in Appendix B of this Engineering Report.

# 5. CLOSURE SCHEDULE AND SEQUENCE

## 5.1 Schedule of Closure Milestones

Partial closure refers to the closure of a portion (increment) of the Class Three Landfill. Final closure is achieved upon closure of the entire Class Three Landfill. The landfill will be closed incrementally in phases as cells/areas of filling are brought to final waste grades. The schedule of closure milestones is presented below in Table 3, and details of the closure sequence are provided in the remainder of this section.

**Table 3**
**Schedule of Closure Milestones**
(the first four entries apply to each partial closure increment, and all entries apply to final closure)

| Event | Timeframe |
|---|---|
| Notify DHEC of intent to close a given increment | Just prior to receipt of final wastes within that area |
| Prepare closure construction plans, obtain bids, and select contractor | 90 days following provision of DHEC notice |
| Construct final cover system | Within 180 days following initiation of construction |
| Submit closure certification to DHEC | 60 days following construction of each increment |
| Place notation on the deed to the landfill facility property that the land was used as a landfill and that its use is restricted | 30 days following DHEC issuance of landfill facility final closure |

## 5.2 Landfill Closure Sequence

As described above, the landfill will be closed incrementally in phases, consistent with the sequence of filling shown on the Engineering Drawings. Partial closure events will occur as cells/areas of filling are brought to final waste grades so that a significant

portion of the landfill has reached the final waste grades. When the Class Three Landfill is at total capacity, or once the last remaining active area achieves final waste grades, closure activities for final closure of the Class Three Landfill will begin. The steps for implementing the closure process are described in the following subsections. The steps are the same for partial closure and final closure.

## 5.3 Determination of Closure Area

Santee Cooper will determine the number of closure events and size of each closure event. Closure construction will not be initiated until final grades of a suitable sized landfill area are achieved based on factors such as construction logistics and economics. The landfill will be surveyed periodically to determine the status and estimate areas that have reached the final waste grades

## 5.4 Construction Contract Documents

Construction documents, including drawings, specifications, and bid documents, will be prepared for each closure event. The drawings and specifications will be in accordance with the design presented on the Engineering Drawings and the standards and requirements given in the permitted Technical Specifications.

## 5.5 Notification of Intent to Close

Prior to the beginning of a closure event, Santee Cooper will submit a Notice of Intent to Close to DHEC. The notice will include a description of the area to be closed, acreage, and a schedule outlining the closure activities to be performed.

## 5.6 Initiation of a Closure Event

Santee Cooper requests an exemption from the 30 day limit for beginning closure activities as outlined in the schedule for closure in Section 258.60.c. of Part V, Subpart F. Specifically, Santee Cooper requests that up to 90 days be allowed for completion of necessary construction drawings and selection of a qualified contractor to perform the work for each closure event. It is our experience that a period of 30 days is not enough to allow proper pre-construction preparation work following notification of DHEC of intent to close. Closure construction activities will begin a closure event within 90 days of receiving the final waste to be placed within the area/increment represented by that

closure event, or if the cell/area is to receive additional wastes, no more than one year after the most recent receipt of wastes.

## 5.7 Completion of a Closure Event

As outlined in the schedule of closure milestones in Table 3, the facility will complete closure construction activities within 180 days of initiation for a given closure event. Should an extension to this limit be required, Santee Cooper will request an extension from DHEC at that time. In all cases Santee Cooper will maintain landfill slopes and cover as needed to prevent threats to human health or the environment.

## 5.8 Certification of Closure

Within 60 days of completion of each final system construction event, a certification of closure construction (construction certification report as specified in the CQA Plan) will be prepared and submitted to DHEC for approval. This construction certification report will be sealed by a duly licensed South Carolina professional engineer other than the design engineer, verifying that the closure has been completed in accordance with this Closure Plan (and the DHEC-approved Technical Specifications and CQA Plan referenced herein). A copy of all closure construction certification reports shall be placed in the Operating Record.

## 5.9 Record Notation to Deed

Within 30 days of DHEC's issuance of final closure approval of the last area of the Class Three Landfill, and using a form approved by DHEC, Santee Cooper shall record with the appropriate Register of Deeds, a notation in the record of ownership of the property - or some other instrument which is normally examined during title search - that will in perpetuity notify any potential purchaser of the property that the land or a portion thereof was used for the disposal of solid waste. This notice shall define the final boundaries of the waste disposal area including the latitude and longitude, identify the type, location, and quantity of solid waste disposed on the property, and advise potential owners of the property that there are land use restrictions.

Santee Cooper may request permission from DHEC to remove this notation from the deed if all wastes are properly removed from the landfill facility and there is no environmental impact.

## 6. CLOSURE COST ESTIMATE AND FINANCIAL ASSURANCE

A detailed written cost estimate for closure activities is provided as Attachment A of this Closure Plan. This cost estimate is in current dollars and is based on hiring a third party to close the largest area of the landfill ever requiring final cover at any time during the active life (when the extent and manner of its operation would make closure the most expensive), based on the planned incremental closure sequence and this Closure Plan. Santee Cooper will adjust the closure cost estimate and corresponding amount of financial assurance annually for inflation and any changes to this Closure Plan or landfill conditions that would increase the cost to close the landfill.

Santee Cooper will provide a demonstration of financial assurance, using an allowable mechanism, for the Class Three Landfill in accordance with the requirements of Part I, Section E.1 of R.61-107.19. If conditions call for a reduction in the amount to be financially assured, Santee Cooper will submit justification to DHEC for review and approval prior to officially reducing the amount.

Financial assurance for closure activities will be maintained until final closure activities at the Class Three Landfill have been completed, certification of final closure is submitted to and approved by DHEC, a deed notation identifying the Class Three Landfill and associated restrictions is recorded, and Santee Cooper is released from financial assurance requirements.

# ATTACHMENT A

# CLOSURE COST ESTIMATE

**Attachment A**

**Closure Cost Estimate**

**Class Three Landfill - Largest and Most Expensive Area Requiring Closure**

**Winyah Generating Station, Georgetown County, South Carolina**

| | | | | | |
|---|---|---|---|---|---|
| | Largest landfill area requiring closure at any time: | 31.3 | AC | Date Prepared: | August 2016 |

| Item Number | Description | Estimated Quantity | Unit | Unit Price | Total Closure Cost |
|---|---|---|---|---|---|
| 1 | Bonds, Insurance, Mobilization and Demobilization | 5% | LS | $ 267,979 | $ 267,979 |
| 2 | Temporary Stormwater Water Management | 31.3 | AC | $ 3,000 | $ 93,900 |
| 3 | Cover Subgrade Preparation | 31.3 | AC | $ 9,000 | $ 281,700 |
| 4 | Reinforced Geosysnthetic Clay Layer (GCL) [1] | 1,363,428 | SF | $ 0.60 | $ 818,057 |
| 5 | 20-mil LLDPE Flexible Membrane Liner | 1,363,428 | SF | $ 0.35 | $ 477,200 |
| 6 | Geocomposite Drainage Layer | 1,363,428 | SF | $ 0.45 | $ 613,543 |
| 7 | 24-Inch Erosion/Vegegative Layer (Cover Soil + Topsoil) | 100,995 | CY | $ 5.00 | $ 504,973 |
| 9 | 18" HDPE Downdrain Pipe | 2,000 | LF | $ 40.00 | $ 80,000 |
| 10 | Waste Excavation and Disposal for Downdrain Pipes | 1,375 | CY | $ 8.00 | $ 11,000 |
| 11 | Structural Fill for Downdrain Pipes | 1,250 | CY | $ 5.00 | $ 6,250 |
| 12 | Downdrain Inlets | 27 | EA | $ 2,500 | $ 67,500 |
| 14 | Downdrain Outlet Concrete Pads with Energy Dissipators | 5 | EA | $ 2,250 | $ 11,250 |
| 16 | Gravel Final Cover Access Road | 6,100 | SY | $ 27.00 | $ 164,700 |
| 17 | Seeding & Mulching | 31.3 | AC | $ 2,750 | $ 86,075 |
| 18 | Erosion Control Matting | 151,492 | SY | $ 5.00 | $ 757,460 |
| 19 | Miscellaneous Work & Cleanup | 31.3 | AC | $ 7,500 | $ 234,750 |
| 20 | Engineering and CQA Services | 31.3 | AC | $ 15,000 | $ 469,500 |
| 21 | 5% Contingency of Above Items | 5% | LS | $ 281,378 | $ 281,378 |
| | | | | **Total Closure Cost [1]** | **$ 5,227,214** |
| | | | | *Closure Cost per Acre [2]* | *$ 167,004* |

Notes:

1. This cost estimate is conservatively based on Final Cover System Design Option 2 (which is the more expensive of the two options).

2. Closure cost per acre may be used to calculate the estimated closure cost for other areas requiring closure by taking this per-acre rate multiplied by the number of acres.

# APPENDIX B

## Permitted Closure Plan Supplement
## For ClosureTurf® Final Cover System Option

*Prepared for*

**Santee Cooper Power**
1 Riverwood Drive
Moncks Corner, South Carolina 29461

# CLOSURE PLAN SUPPLEMENT

# for

# CLOSURETURF® FINAL COVER SYSTEM OPTION

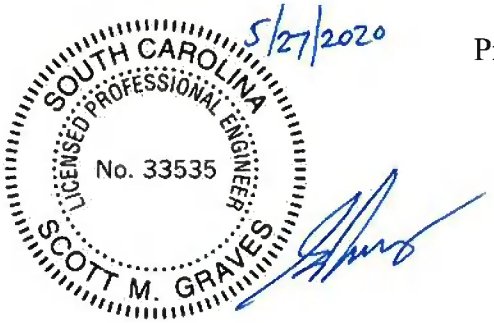
## WINYAH GENERATING STATION
## NON-COMMERCIAL CLASS THREE LANDFILL
## Georgetown, South Carolina

*Prepared by*


Geosyntec consultants

engineers | scientists | innovators

201 E. McBee Avenue, Suite 201
Greenville, South Carolina 29601




Project Number GSC5242

May 2020

# TABLE OF CONTENTS



## TABLE OF CONTENTS (Continued)



## ATTACHMENTS




# 1. INTRODUCTION

## 1.1 Purpose

This Closure Plan Supplement, hereafter referred to as the "Supplemental Package" has been prepared by Geosyntec Consultants (Geosyntec) for the Class Three Landfill at Santee Cooper's Winyah Generating Station (WGS) located in Georgetown County, South Carolina. Geosyntec prepared this Supplemental Package on behalf of the permit applicant – the South Carolina Public Service Authority doing business as (d.b.a.) Santee Cooper (Santee Cooper).

The purpose of this Supplemental Package is to add an alternative final cover system using a synthetic-turf type of product known as ClosureTurf® as an allowable final cover system option for closure of the Class Three Landfill.

The approved Closure Plan included in the Class Three Landfill permit application addresses the steps necessary to close the landfill, and addresses the information required by Section 258.60.c of R.61-107.19, Part V, Subpart F. The Closure Plan also explains the related closure requirements that will apply, pursuant to Sections 258.60.d. through o. of these regulations. As required by Section 258.60.d., this Supplemental Package represents an update (as a supplement) to the approved closure plan pertaining to the proposed addition of the ClosureTurf® final cover system option.

This Supplemental Package has been prepared to address the applicable Closure requirements for an alternative final cover, pursuant to South Carolina Department of Health and Environmental Control (DHEC) Regulation R.61-107.19, Part V, Subpart F, Section 258.60.b. Other than the final cover system design and construction changes presented herein for the ClosureTurf® final cover system option, the overall closure provisions required by the approved Closure Plan shall continue to apply.

## 1.2 Contents of This Supplemental Package

The following information is provided in the remainder of this Supplemental Package:

- a description of the proposed alternative final cover system option using ClosureTurf®;

- methods and procedures that will be used to install the cover, along with associated construction quality assurance/quality control (QA/QC) procedures and material specifications;
- surface water management system performance;
- final cover system equivalency;
- post-installation inspection and maintenance procedures; and
- closure and post-closure cost estimates using the ClosureTurf® final cover system.

# 2. CLOSURETURF® FINAL COVER SYSTEM DESIGN

## 2.1 Introduction

The WGS Class Three Landfill permit currently allows two final cover system options (identified in the approved permit application as "Option 1" and "Option 2"). Final cover system Options 1 and 2 are described in the approved Closure Plan, and are illustrated on the approved set of Engineering Drawings. This Supplemental Package proposes to add a third final cover system option (i.e., "Option 3") as described below.

The main feature of Option 3 is the use of a type of alternative geomembrane/artificial turf system known as ClosureTurf®. Therefore, Option 3 will be referred to hereafter as the "ClosureTurf® final cover system option".

## 2.2 Engineering Design Drawings

A series of engineering design drawings for the ClosureTurf® final cover system option is included as Attachment A to this Supplemental Package. These drawings present the engineering details that will apply to closure using the ClosureTurf® final cover system option. The engineering details included in Attachment A present an illustration of the ClosureTurf® system (see Drawing 1, Detail 1), along with various details presenting cross-sectional views of various landfill slopes and perimeter areas, tie-ins, and surface water management features on the final cover.

## 2.3 Description of the ClosureTurf® Final Cover System Option

ClosureTurf® is a patented engineered cover system product offered by Watershed Geosynthetics LLC (WatershedGeo), made up of three components consisting of, from bottom to top: (i) a structured linear low-density polyethylene (LLDPE) geomembrane (50-mil nominal thickness) that also integrates an approximately 130-mil thick studded drainage layer on the top, and with spikes on the bottom of the geomembrane; (ii) an engineered-turf protective layer consisting of high-density polyethylene (HDPE) grass blades adhered to a woven geotextile backing; and (iii) a thin layer (about 0.5 inches [in.] thick) of sand infill which is primarily used for ballasting.

As illustrated on Detail 1 of Drawing 1 in Attachment A, the geomembrane component of the ClosureTurf® system will be placed directly on top of either an 18-inch thick low

permeability compacted soil infiltration layer (with $k \leq 1 \times 10^{-5}$ cm/sec), or a needlepunched reinforced geosynthetic clay liner (GCL).

The use of a GCL in lieu of the 18-inch low permeability compacted soil infiltration layer is already approved for the current permit, and GCL equivalency to this compacted soil has already been demonstrated in an appendix to the approved Engineering Report. GCL equivalency is not repeated herein; however, please note that a ClosureTurf®-specific equivalency demonstration *is* provided subsequently in this Supplemental Package.

## 2.2 Alternative Final Cover System Design Criteria

The ClosureTurf® final cover system is designed and will be constructed to:

- provide long-term minimization of infiltration of precipitation into disposed wastes within the landfill, namely to:
    - achieve an equivalent reduction in infiltration as the infiltration layer specified in paragraphs a.(1) and a.(2) of Section 258.60.a of R.61-107.19, Part V, Subpart F;
    - include a composite barrier (geomembrane placed directly on an infiltration layer) that meets or exceeds the composite barrier specified in Section 258.60.k of R.61-107.19, Part V, Subpart F;
- promote drainage while minimizing erosion of the final cover, namely to
    - provide equivalent protection from wind and water erosion as the erosion layer specified in paragraph a.(3) of Section 258.60.a of R.61-107.19, Part V, Subpart F; and
- function with minimal maintenance over the post-closure period.

# 3. CLOSURETURF® INSTALLATION

## 3.1 QA/QC Report

The approved Class Three Landfill permit application includes a comprehensive QA/QC Report. The QA/QC Report includes a Construction Quality Assurance (CQA) Plan and Technical Specifications. These existing documents present the requirements for final cover system installation and for associated observation, documentation, and testing – culminating with preparation and submittal of a certification of closure construction (construction certification report).

The approved Technical Specifications and CQA Plan address the comprehensive requirements that will apply during closure construction of the ClosureTurf® final cover system option. This Supplemental Package provides additions to the Technical Specifications and CQA Plan to include information specific to the ClosureTurf®, as discussed below.

## 3.2 Construction Quality Assurance (CQA)

A CQA Plan Supplement, specific to ClosureTurf®, is provided in Attachment B of this package. The CQA Plan Supplement provides the requirements for monitoring, testing, and documenting the materials and construction/installation of the ClosureTurf® final cover system components that are not already covered in the main CQA Plan.

## 3.3 Technical Specification

A ClosureTurf® Technical Specification is provided in Attachment B of this Supplemental Package. Installation of the ClosureTurf® final cover system will be performed in accordance with the design presented on the attached Engineering Drawings and the standards outlined in the attached Technical Specification. This specification also includes the required material properties. This specification was developed consistent with guidance provided in the *ClosureTurf® Installation Guidelines Manual* by WatershedGeo, dated December 2018. Within the attached specification, reference is made that requires installation in accordance with manufacturer recommendations.

# 4. SURFACE WATER MANAGEMENT SYSTEM

## 4.1 Overview of Surface Water Management System

The layout of the surface water management system features on the Class Three Landfill areas is not changing as a result of the ClosureTurf® final cover system option. The manner in which stormwater run-off will be conveyed off the final cover is summarized below.

- The final cover system surface for the ClosureTurf® option will be the synthetic turf (engineered-turf and sand ballast – with the visible appearance of a grass-like surface). The landfill areas are designed with sideslopes inclined at 3 horizontal to 1 vertical (3H:1V) in-between drainage terraces and top surface slopes (top deck areas) are inclined at a nominal 3 to 5 percent slope.

- The final cover sideslopes have drainage terraces spaced approximately every 30 feet vertically, and with typical drainage profile slopes at 2 percent.

- The drainage terraces will convey water to downdrain pipes spaced periodically around each landfill area.

- Downdrain pipes will outlet into either constructed perimeter drainage channels/culverts, or will directly outlet into existing site drainage features (i.e., the discharge canal or cooling pond).

The engineering drawings included in Attachment A of this supplement illustrate the configuration of these surface water management components using/in conjunction with the ClosureTurf® final cover system.

## 4.2 ClosureTurf®-Specific Surface Water Management System Calculations

Not surprisingly, the ClosureTurf® system with its artificial turf surface, produces greater runoff volumes at higher rates than for a conventional final cover system with a soil surface layer and grassy vegetation. Attachment C of this Supplemental Package presents calculations of hydrology and hydraulics (H&H) analyses to estimate the rates of runoff from the ClosureTurf® system generated by the design storm. The calculations also evaluate the hydraulic design/sizing necessary for the surface water management system conveyances (terraces, downdrain pipes, perimeter

channels/culverts) to adequately manage flows from the design storm. The outcome of these calculations is the proper sizing of these conveyances, demonstrating that the surface water management features for the ClosureTurf® final cover system option, as presented on the engineering drawings included with this Supplemental Package, are adequate to manage the design storm.

# 5. FINAL COVER SYSTEM EQUIVALENCY

## 5.1 Standard Final Cover System

The approved Class Three Landfill permit application includes a "standard" (i.e., regulatory prescriptive) final cover system. The aforementioned "Option 1" final cover system for this facility uses this standard final cover system, which is composed of the following components (from top to bottom):

- a 2-ft thick layer of soil capable of supporting native vegetation (further subdivided into an upper 6-inch thick topsoil layer and a lower 18-inch thick protective cover soil layer);
- a geocomposite drainage layer (geotextile filters bonded to both sides of a geonet drainage core);
- a flexible membrane liner (FML), which will be a 20-mil (minimum) thick LLDPE geomembrane liner, textured on both sides; and
- an 18-inch thick infiltration layer of compacted soil with a maximum hydraulic conductivity of $1 \times 10^{-5}$ cm/sec and capable of providing a suitable foundation for the FML.

## 5.2 Hydraulic Barrier Equivalency of the ClosureTurf® Final Cover System

The ClosureTurf® final cover system has a composite cover barrier infiltration layer that achieves an equivalent reduction in infiltration as the infiltration layer of the approved Option 1 final cover system listed above (which is the standard composite barrier layer prescribed by R.61-107.19, Part V, Subpart F, Section 258.60.k.). A demonstration of hydraulic equivalency is provided in Attachment D of this Supplemental Package. The evaluation in Attachment D demonstrates that the ClosureTurf® final cover system provides equivalent (and in fact, superior) hydraulic barrier performance based on its calculated lower rate of infiltration through the final cover than the infiltration through the standard final cover system.

## 5.3 Erosion Layer Equivalency of the ClosureTurf® Final Cover System

The surface water management system calculations for final cover conditions using ClosureTurf® are included in Attachment C of this supplemental package. These calculations demonstrate that the surface water management features are adequately sized to manage and convey stormwater off the ClosureTurf® final cover system.

Also, with respect to erosion and wind resistance, the ClosureTurf® final cover system option includes a synthetic engineered-turf material as the upper layer of the final cover system that has been shown through laboratory testing and field performance to provide superior resistance to wind and water erosion as compared to the erosion layer of the standard (regulatory prescribed) final cover. This information is documented in the *ClosureTurf® Design Guidelines Manual* by WatershedGeo, dated March 2019.

The resulting WGS Class Three Landfill-specific design of the ClosureTurf® final cover system option is consistent with the above-referenced developer/manufacturer's design guidelines manual. This includes the incorporating the recommended sand infill gradation that has been found able to withstand higher rainfall intensities larger than those expected at this site, and using slope lengths and steepness that are well within design guidelines. Also, the drainage terraces will be lined with an enhanced ballast layer as shown on the engineering drawings in Attachment A, providing further erosion resistance for the stormwater flow velocities and stresses.

With respect to wind resistance and stability, the design guidelines manual includes the results of wind tunnel testing that showed low uplift pressures (i.e., 0.12 psf) on the engineered-turf component of the ClosureTurf® system when exposed to 120 mph winds. The sand infill layer of the ClosureTurf® system will provide ballast well in excess of these uplift pressures (i.e., about 4.5 psf), thus indicating a substantial factor of safety against wind uplift. The wind tunnel testing also showed even less uplift pressures at even higher wind speeds due to a downward-force-effect of very high winds (> 120 mph) on the blades of grass.

Based on the foregoing, the ClosureTurf® final cover system will provide equivalent (or superior) protection from wind and water erosion as the erosion layer specified for the regulatory prescribed standard final cover.

# 6. POST-INSTALLATION INSPECTIONS AND MAINTENANCE

This section addresses the inspections and maintenance that will be performed for the ClosureTurf® final cover system after it is installed. This includes inspections and maintenance on increments of installed final cover, as well as inspections and maintenance after final closure of the facility during the post-closure care period.

## 6.1 Inspection and Maintenance Frequency

After the ClosureTurf® final cover system is installed, it will be inspected on a quarterly basis. Maintenance will be conducted as needed (i.e., when results of the inspections reveal the need for repairs). Details of the inspections and maintenance activities are described below.

## 6.2 Inspection and Maintenance Procedures

Santee Cooper will inspect installed areas of the ClosureTurf® final cover system at the frequency indicated above, to assess its integrity and effectiveness. Inspections will be to monitor for final cover system damage or adverse effects that could compromise the ability of the final cover from providing the level of protection required by the regulations. Inspections will include monitoring of the components and features described below.

- Sand Infill Observations. Walk along the landfill perimeter toe-of-slope, each drainage terrace, and on landfill top-areas, and observe the adjacent final cover surfaces for indications of erosion of the sand infill. Indications include visible signs of:
    - erosion rills;
    - areas with a loss of infill (synthetic turf without ballast); or
    - down-slope/down-gradient areas of deposited sand infill (indicative of washout/erosion occurrence).
- Sand Infill Documentation and Measurements.

- Maintain a written log (e.g., checklist or form) of inspections, including notes describing any observed loss of infill. Locate such areas on a site plan figure, and include photographic documentation.

- If there are indications of partial loss of sand infill, measurements may be taken to delineate the thickness of remaining sand infill and to establish the area of erosion. These measurements may be performed using a blunt probe and manually measuring sand infill thickness to the nearest tenth of an inch.

- Such measurements may also be considered on a periodic/repeat basis (e.g., every few years) to check for rate of soil loss as a forecasting tool for scheduling preventative maintenance.

- Engineered-Turf Observations. During the inspection walk of the landfill perimeter toe-of-slopes, drainage terraces, and landfill top-areas, also observe the condition of the engineered-turf for indications of shifting/movement/instability, and for other damage or deterioration. Indications include visible signs of:

  - areas of wrinkles/ripples or folds in the engineered-turf;

  - areas of turf in tension;

  - evidence of movement or shifting of the engineered-turf, or similarly, loose strands of fabric or yarn;

  - damaged, cut, or torn engineered-turf;

  - areas of exposed geomembrane; or

  - changes in turf color or condition of synthetic grass blades (potentially indicative of ultraviolet (UV) damage)

- Engineered-Turf Documentation and Measurements.

  - Document the condition of the engineered-turf using the written log described previously (accompanied by figure(s), photographs).

- If UV degradation is suspected to the extent it may compromise the performance of the final cover system, a sample of the turf may be removed for testing to compare the in-service properties to the manufactured properties that were documented as part of installation.

Maintenance/repairs will be conducted as needed to correct areas of concern that could negatively impact the ability of the final cover from providing the level of protection required by the regulations. Such maintenance/repairs will be to correct the observed damage or adverse effects described above, stemming from erosion, wind uplift, instability/movement of the synthetic turf, settlement or subsidence of underlying waste materials, vehicle traffic, vandalism, animal activity, or other events; and to prevent run-on and run-off from eroding or otherwise damaging the final cover.

## 7. CLOSURE AND POST-CLOSURE COST ESTIMATES

Closure and Post-Closure Cost Estimates for the ClosureTurf® final cover system option are provided as Attachment E of this Supplemental Package.

The basis for these cost estimates is consistent with the assumptions used to generate the current-permitted cost estimates (current dollars, based on hiring a third party to close the largest area of the landfill ever requiring final cover at any time during the active life (when the extent and manner of its operation would make closure the most expensive), based on the planned incremental closure sequence).

# ATTACHMENT D

# CLOSURETURF® FINAL COVER SYSTEM EQUIVALENCY DEMONSTRATION

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Written by: | V. Taukoor | Date: | 04/27/2020 | Reviewed by: | S. M. Graves | Date: | 05/08/2020 |
| Client: | Santee Cooper | Project: | Winyah Generating Station | Project No.: | GSC5242 | Task No.: | 20BT |

# CLOSURETURF® HYDRAULIC EQUIVALENCY

# CALCULATION PACKAGE

# (HELP MODELING)



SEALED FOR
CALCULATION PAGES 1 THROUGH 47

## PURPOSE

Currently (as-permitted), the Class Three Landfill design at the Winyah Generating Station (WGS) includes a final cover system referred to as "Option 1", which is the standard composite barrier layer prescribed by R.61-107.19, Part V, Subpart F, Section 258.60.k. WGS is proposing to add an alternative final cover system using a synthetic-turf type of product known as ClosureTurf® as an allowable final cover system option, referred to as "Option 3".

The purpose of this calculation package is to evaluate the hydraulic performance of the proposed ClosureTurf® final cover system compared to the "standard" (i.e. regulatory prescriptive) final cover system. The results presented herein are used to evaluate whether the ClosureTurf® final cover system is hydraulically equivalent to the standard final cover system. This is done by comparing the following items for each cover system:

- Percentage of precipitation incident on the cover system that gets converted to:
  - Direct runoff;
  - Evapotranspiration;
  - Infiltration collected by the geocomposite drainage layer;
  - Infiltration that reaches the waste in the pond; and
- The hydraulic head on the geomembrane.

The remainder of this package is organized to present the following: (i) cover system details; (ii) analysis methodology; (iii) model parameters and material properties; and (iv) analysis results; and (v) summary and conclusions.

## COVER SYSTEM DETAILS

The Option 1 (the approved standard final cover system) consists of the following components, from top to bottom:

- a 2-foot (ft) thick soil layer, consisting of a 0.5-foot (ft) thick layer of topsoil (vegetative cover for erosion) and a 1.5-ft thick layer of soil with a minimum hydraulic conductivity ($k_{min}$) of $1 \times 10^{-4}$ cm/s layer (protective cover for infiltration reduction);
- a 200-mil geocomposite drainage layer (geotextile filters bonded to both sides of a geonet drainage core);
- a 20-mil thick linear low-density polythylene (LLDPE) geomembrane (geomembrane liner); and
- an 18-inch (in) thick compacted soil layer with a maximum hydraulic conductivity ($k_{max}$) of $1 \times 10^{-5}$ cm/s).

The proposed Option 3 (ClosureTurf® final cover system), consists of the following components, from top to bottom:

- a 0.5-inch (in.) thick (min) sand infill layer used primarily as ballast;
- an engineered-turf (i.e., artificial grass) protective layer consisting of high-density polyethylene (HDPE) grass blades adhered to a woven geotextile backing;
- a structured linear low-density polyethylene (LLDPE) (50-mil nominal thickness) geomembrane that also integrates an approximately 130-mil thick studded drainage layer on the top, and with spikes on the bottom of the geomembrane; and
- an 18-inch (in) thick compacted soil layer with a maximum hydraulic conductivity ($k_{max}$) of $1 \times 10^{-5}$ cm/s).

The cover systems corresponding to *Option 1* and *Option 3* are shown respectively in **Figure 1 and Figure 2.** As noted on Figure 2, the geomembrane component of the ClosureTurf® may be underlain by a needlepunched reinforced geosynthetic clay liner (GCL) instead of the 18-inch compacted soil layer; for this calculation package, *Option 3* is modeled using the compacted soil layer.

For reference, it is noted that *Option 2* is a final cover system that bears resemblance to *Option 1*, with the only difference between them being that the fourth component of *Option 1* (18-in thick compacted soil layer or "Clay Liner") is substituted by a hydraulically-equivalent (or superior) GCL layer. As part of the approved permit application for the WGS Class Three Landfill, an analysis showing the hydraulic equivalence of *Option 2* to *Option 1* was submitted. Therefore, if the hydraulic equivalence of *Option 3* to *Option 1* can be shown (the main aim of this package), it can be reasoned that *Option 3* would also be hydraulically equivalent to *Option 2*. As such, it is not necessary to quantitatively evaluate the hydraulic equivalence of *Option 3* to *Option 2* (nor is it necessary to model *Option 3* using the GCL), and this package focuses on whether *Option* 3 achieves an equivalent reduction in infiltration as the infiltration layer specified in the regulatory-prescribed standard final cover system of *Option 1*.

## ANALYSIS METHODOLOGY

The hydraulic performance of the cover systems presented in this package was modeled using the Hydrologic Evaluation of Landfill Performance (HELP) software, Version 3.07, developed for the U.S. Environmental Protection Agency (USEPA) [Schroeder et al., 1994a and 1994b].

The HELP program is a quasi-two-dimensional hydrologic model of water movement properties of the waste materials as well as those of the components of the soil and geosynthetic liner systems and cover systems that may be present. The program accepts climate, soil, and design input data, and uses a solution technique that accounts for the effects of surface storage, runoff, infiltration, percolation, evaporation, soil moisture storage, and lateral drainage.

The hydrologic processes considered in the *HELP* model include precipitation, surface-water evaporation, runoff, infiltration, plant transpiration, soil water evaporation, soil water storage, vertical drainage (saturated and unsaturated), lateral drainage (saturated), vertical drainage (saturated) through compacted soil liners, and leakage through geomembranes.

## MODEL PARAMETERS AND MATERIAL PROPERTIES

The HELP model requires five (5) sets of input for computation, each of which is briefly described below and in the following section.

1. Precipitation data;
2. Temperature data;

3. Solar radiation data;
4. Evapotranspiration and weather data; and
5. Soil and design materials data.

Inputs 1 through 4 are described in more detail in **Attachment A** and **Attachment B**.

Input 5 is presented in **Table 1**.

**Input 1: Precipitation Data**

Geosyntec generated thirty years of synthetic precipitation data for the site location using the synthetic weather generator in the *HELP* model and the available precipitation data for Charleston, South Carolina. The precipitation data for Charleston is assumed to have approximately the same statistical characteristics as the historical data at the site (i.e., no adjustment to the data available in the *HELP* model was made).

**Input 2: Temperature Data**

Geosyntec generated thirty years of synthetic daily temperature data for the site location using the synthetic weather generator in the *HELP* model and the available daily temperature data for Charleston, South Carolina. The daily temperature data for Charleston is assumed to have approximately the same statistical characteristics as the historical data at the site.

**Input 3: Solar Radiation Data**

Geosyntec generated thirty years of synthetic solar radiation data for the site location using the synthetic weather generator in the *HELP* model and the available solar radiation data for Charleston, South Carolina. The daily solar radiation data for Charleston is assumed to have approximately the same statistical characteristics as the historical data at the site.

A site latitude of 32.90 degrees was used, which is based on the available solar radiation data in *HELP* for Charleston, South Carolina.

**Input 4: Evapotranspiration and Weather Data**

The evaporative zone depth is defined as the maximum depth from which water may be removed by evapotranspiration. This depth affects the storage of water near the surface and directly impacts the computations for evapotranspiration and runoff [Schroeder et al., 1994a and 1994b].

The evaporative zone depth for *Option 1* was selected as 22 in. using the *HELP* model default value for vegetated areas (i.e., vegetative cover) near Charleston, South Carolina. The evaporative zone depth was selected as 0.6 in. for *Option 3*, which is the approximate thickness of the ClosureTurf® system (i.e., the thickness of the structured geomembrane, synthetic turf, and sand infill).

A maximum leaf area index (LAI) of two was selected for *Option 1*, whereas a LAI of zero was used for *Option 3*. The average wind speed used for both cover systems was 8.7 miles per hour, based on the available evapotranspiration and weather data for Charleston, South Carolina.

Relative humidity values for each quarter of the year inputted into the *HELP* model were 70.0%, 74.0%, 80.0%, and 75.0%. These values are based on the available evapotranspiration and weather data in *HELP* for Charleston, South Carolina.

**Input 5: Soil and Design Materials Data**

***General Design***

Each cover system is assigned a unit area of one (1) acre. The Soil Conservation Service (SCS) surface runoff curve number for *Option 1* was computed to be 87.4 based on a material texture number of 10 [Schroeder et al., 1994a and 1994b], a fair stand of grass, a surface slope (site slope) of 33% and a slope length of 100 feet (ft). The SCS surface runoff curve number for *Option 3* was assigned a value of 93.0 based on the manufacturer design guidelines and Geosyntec's experience.

***Combined Topsoil and Protective Cover Soil Layer – Option 1***

The topsoil and protective cover soils layers for *Option 1* are modeled as a single layer acting as a vertical percolation layer having *HELP* material texture 10 which is representative of clayey sand material (USCS Classification SC). This layer is modeled with a hydraulic conductivity (k) of $1.2 \times 10^{-4}$ centimeter per second (cm/s).

***Geocomposite Drainage Layer – Option 1***

The geocomposite drainage layer for *Option 1* is modeled as a lateral drainage layer with *HELP* material texture 20 (representative of 0.2-in. thick geonet drainage layer) and having a slope of 33% and a slope length of 100 ft.

The design hydraulic conductivity of the geocomposite drainage layer is calculated by dividing the in-plane permit hydraulic transmissivity ($1.0 \times 10^{-4}$ $m^2$/sec) by the thickness of the layer (0.20 inches). The calculated hydraulic conductivity is then reduced by a factor of 2.4 to

represent the hydraulic conductivities expected for long-term conditions (*Reduction Factor*, RF = 2.4). The hydraulic conductivity of the geocomposite drainage layer selected for use in the model was 0.82 cm/sec.

***20-mil LLDPE Geomembrane – Option 1***

The 20-mil LLDPE geomembrane for *Option 1* is modeled as a flexible membrane liner with *HELP* material texture 36 (representative of linear low-density polyethylene (LLDPE) geomembrane).

The geomembrane is modeled to have good installation quality (Placement Quality = 3) that can be achieved with third-party construction quality assurance (CQA) and testing. The *Installation Defect Density*, which is the number of defects (diameter of hole larger than the geomembrane thickness) per unit area resulting primarily from seaming faults and punctures during installation, was assigned a value of 2 per acre in the model. *Pinhole Density*, which is the number of defects (diameter of hole equal to or smaller than the geomembrane thickness) per unit area, was assigned a value of 2 per acre in the model.

The values selected for use in model for *Installation Defect Density* and *Pinhole Density* are assumptions for design purposes only and do not correspond to the expected or allowable defect and pinhole density.

A geomembrane saturated hydraulic conductivity of $4.0 \times 10^{-13}$ cm/sec was selected for use in the model.

***Compacted Soil Layer – Option 1***

The compacted soil layer for cover system A is modeled as a barrier soil liner with *HELP* material texture 16. The hydraulic conductivity of this layer was conservatively selected to be $1 \times 10^{-5}$ cm/s.

***ClosureTurf® Engineered Turf – Option 3***

The ClosureTurf® Engineered Turf for *Option 3* includes a 0.5-in (min) sand in-fill and a 0.1-in turf material. This layer is modeled as a 0.6 in-thick vertical percolation layer having *HELP* material texture 2, which is representative of sandy material (USCS Classification SW), and having a hydraulic conductivity of $2.5 \times 10^{-2}$ cm/s based on the manufacturer's design guidelines and Geosyntec's experience.

***Geotextile Turf-Backing – Option 3***

The woven geotextile backing layer for cover system B is not modeled in the *HELP* analyses due to its relatively small thickness and high permittivity.

***Studded Drainage Layer for Super Gripnet® – Option 3***

The Studded Drainage Layer for Super Gripnet® for *Option 3* is modeled as a 130-mil lateral drainage layer with *HELP* material texture 20 having a slope of 33% and a slope length of 100 ft.

A typical value of in-plane hydraulic transmissivity of the Gripnet drainage layer is $2.5 \times 10^{-3}$ $m^2$/sec according to the manufacturer's design guidelines. The hydraulic conductivity is calculated by dividing the hydraulic transmissivity by the thickness of the layer (0.13 in). The calculated hydraulic conductivity is then reduced by a factor of 2.4 to represent the hydraulic conductivities expected for long-term conditions (RF = 2.4). The hydraulic conductivity of the Gripnet layer selected for use in the model was 31.6 cm/sec.

***50-mil LLDPE Geomembrane – Option 3***

The 50-mil LLDPE geomembrane for *Option 3* is modeled as a flexible membrane liner with *HELP* material texture 36 (representative of linear low-density polyethylene (LLDPE) geomembrane).

The geomembrane for *Option 3* is modeled with the same installation quality, installation defect density and pinhole density as the 20-mil LLDPE Geomembrane for *Option 1* (respectively: 3, 2 per acre, 2 per acre).

A geomembrane saturated hydraulic conductivity of $4.0 \times 10^{-13}$ cm/sec was selected for use in the model.

***Compacted Soil Layer – Option 3***

The compacted soil layer for *Option 3* is modeled as a barrier soil liner with *HELP* material texture 16. The hydraulic conductivity of this layer was conservatively selected to be $1 \times 10^{-5}$ cm/s.

## ANALYSIS RESULTS

The hydraulic performances per unit acre of the permit standard final cover system and proposed ClosureTurf® final cover system evaluated using *HELP* are summarized below and compared in **Table 2** through **Table 4**. The output files are presented in **Attachment A** and **Attachment B**.

The numbers described below and in **Table 2** through **Table 4** should be regarded as tools that allow for a comparison of the hydraulic performances of *Option 1* and *Option 3*. The numbers presented herein do not necessarily represent the actual magnitudes of hydrologic parameters such as runoff at the site.

**Option 1**

Based on the peak daily values (**Table 2**), 52% and 17% of the precipitation were respectively removed by direct runoff and collected by the geocomposite drainage layer. A negligible amount of precipitation (0.017 cubic feet) infiltrated through the final cover system and into the underlying waste. The average pressure head on the geomembrane was 0.065 in.

Based on the average annual values (**Table 3**), 10% of the precipitation was removed by direct runoff, 73% was removed by evapotranspiration and 17% was collected by the geocomposite drainage layer. A negligible amount of precipitation (0.213 cubic feet) infiltrated through the final cover system and into the underlying waste. The average pressure head on the geomembrane was 0.002 in.

Based on the average monthly values (**Table 4**), from January to December, between 5% and 47% of the precipitation was collected by the geocomposite drainage layer and a negligible amount of precipitation reached the underlying waste. The pressure head on the geomembrane was generally less than 0.003 in.

**Option 3**

Based on the peak daily values (**Table 2**), 78% and 29% of the precipitation were respectively removed by direct runoff and collected by the geocomposite drainage layer. A negligible amount of precipitation (0.001 cubic feet) infiltrated through the final cover system and into the underlying waste. The average pressure head on the geomembrane was 0.003 in.

Based on the average annual values (**Table 3**), 22% of the precipitation was removed by direct runoff, 22% was removed by evapotranspiration and 56% was collected by the geocomposite drainage layer. A negligible amount of precipitation (0.024 cubic feet) infiltrated through the final cover system and into the underlying waste. No noticeable pressure head acted on the geomembrane.

Based on the average monthly values (**Table 4**), from January to December, between 49% and 69% of the precipitation was collected by the geocomposite drainage layer and a negligible amount of precipitation reached the underlying waste. The pressure head on the geomembrane was generally less than 0.0003 in.

| Written by: | V. Taukoor | Date: | 04/27/2020 | Reviewed by: | S. M. Graves | Date: | 05/08/2020 |
|---|---|---|---|---|---|---|---|
| Client: | Santee Cooper | Project: | Winyah Generating Station | Project No.: | GSC5242 | Task No.: | 20BT |

## SUMMARY AND CONCLUSIONS

The *HELP* model was used to assess the hydraulic equivalency of the proposed ClosureTurf® final cover system (*Option 3*) to the standard final cover system (*Option 1*). Conclusions are presented below regarding the hydraulic infiltration barrier performance characteristics of the two final cover systems.

- On a peak day, the model predicts that 0.017 cubic feet would infiltrate through *Option 1*, whereas 0.001 cubic feet would infiltrate through *Option 3*.
    - *Option 3* results in a substantial reduction in infiltration on a peak day basis (17 times less infiltration).
- On an average annual basis, the model predicts that 0.213 cubic feet would infiltrate through *Option 1*, whereas 0.024 cubic feet would infiltrate through *Option 3*.
    - *Option 3* results in a substantial reduction in infiltration on an average annual basis (almost 9 times less infiltration).

Based on the *HELP* model calculations presented herein and the comparisons noted above, the results demonstrate that the ClosureTurf® final cover system achieves an equivalent (and in fact, superior) reduction in infiltration as the standard final cover system. Accordingly, the ClosureTurf® final cover system (*Option 3*) is hydraulically equivalent (and in fact, superior) to the permit standard final cover system (*Option 1*).

## REFERENCES

Schroeder, P.R., Lloyd, C.M., Zappi, P.A., and Aziz, N. M. (1994a). The Hydrologic Evaluation of Landfill Performance (HELP) Model, User's Guide for Version 3. U.S. Environmental Protection Agency, Office of Research and Development Washington, D.C., Report No. EPA/600/R094/168a.

Schroeder, P.R., Dozier, T.S., Zappi, P.A., McEnroe, B.M., Sjostrom, J.W., and Peyton, R.L. (1994b). The Hydrologic Evaluation of Landfill Performance (HELP) Model, Engineering Documentation for Version 3. U.S. Environmental Protection Agency, Office of Research and Development, Washington, D.C., Report No. EPA/600/R-94/168b.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Written by: | V. Taukoor | Date: | 04/27/2020 | Reviewed by: | S. M. Graves | Date: | 05/08/2020 |
| Client: | Santee Cooper | Project: | Winyah Generating Station | Project No.: | GSC5242 | Task No.: | 20BT |

# TABLES

Written by: V. Taukoor Date: 04/27/2020 Reviewed by: S. M. Graves Date: 05/08/2020

Client: Santee Cooper Project: Winyah Generating Station Project No.: GSC5242 Task No.: 20BT

**Table 1. Model Parameters and Material Properties**

| Cover System | Component | Alternative Name | HELP Layer Type [Schroeder et al., 1994a, 1995b] | Thickness (inches) | Total Porosity[1] | Field Capacity[1] | Wilting Point[1] | Initial Soil Water Content[2] | Hydraulic Transmissivity, θ (cm/sec) | Saturated Hydraulic Conductivity, k (cm/sec) | Material Texture Number[1] | Slope (%) | Drainage Length (feet) | Pinhole Density (number per acres) | Installation Defects (number per acres) | Placement Quality |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Standard Final Cover System (Option 1) | Combined Topsoil and Protective Cover Soil Layer | Topsoil/Cover | 1 - Vertical Percolation Layer | 24 | 0.398 | 0.244 | 0.136 | 0.321 | N/A | $1.2 \times 10^{-4}$[3] | 10 | N/A | | | | |
| | Geocomposite Drainage Layer | Geocomposite | 2 - Lateral Drainage Layer | 0.20 | 0.850 | 0.010 | 0.005 | 0.021 | $1.0 \times 10^{-4}$[4] | 1.96 (0.82)[5] | 20 | 33 | 100 | N/A | | |
| | 20 MIL (min) LLDPE Geomembrane | Geomembrane | 4 - Geomembrane Liner | 0.02 | N/A | | | | | $4.0 \times 10^{-13}$[6] | 36 | N/A | | 2[7] | 2[8] | 3 - Good |
| | Compacted Soil Layer | Clay Liner | 3 - Barrier Soil | 18 | 0.427 | 0.418 | 0.367 | 0.418 | N/A | $1.0 \times 10^{-5}$ | 16 | N/A | | | | |
| ClosureTurf® Final Cover System (Option 3) | ClosureTurf® Engineered Turf | Protective Turf | 1 - Vertical Percolation Layer | 0.6[9] | 0.437 | 0.062 | 0.024 | 0.321 | N/A | $2.5 \times 10^{-2}$[10] | 2 | N/A | | | | |
| | Geotextile Turf-Backing | Turf-Backing | *(not modelled in HELP)* | | | | | | | | | | | | | |
| | Studded Drainage Layer for Super Gripnet® | Gripnet | 2 - Lateral Drainage Layer | 0.13 | 0.850 | 0.010 | 0.005 | 0.021 | $2.5 \times 10^{-3}$[11] | 75.7 (31.6)[12] | 20 | 33 | 100 | N/A | | |
| | 50-MIL (min) LLDPE Geomembrane | Geomembrane | 4 - Geomembrane Liner | 0.05 | N/A | | | | | $4.0 \times 10^{-13}$[6] | 36 | N/A | | 2[7] | 2[8] | 3 - Good |
| | Compacted Soil Layer | Clay Liner | 3 - Barrier Soil | 18 | 0.427 | 0.418 | 0.367 | 0.418 | N/A | $1.0 \times 10^{-5}$ | 16 | N/A | | | | |

LLDPE - Linear Low Density Polythylene
N/A - Not Applicable

*(Notes on Next Page)*

**Notes:**

1. The values shown for total porosity, field capacity, and wilting point correspond to the default values for the selected *HELP* material texture number.
2. The values shown for Initial Soil Water Content are selected based on recommendations from the *HELP's User Guide V.3* [Schroeder et al., 1994a, 1994b] and Geosyntec's professional experience.
3. The hydraulic conductivity values for the topsoil and cover protective soil layers were selected based on typical values of sandy clay (USCS Classification: SC).
4. The permit in-plane hydraulic transmissivity of the geocomposite drainage layer is $1.0 \times 10^{-4}$ $m^2$/sec.
5. The hydraulic conductivity of the geocomposite drainage layer was calculated by dividing the in-plane permit hydraulic transmissivity by the thickness of the layer.
(i.e., $1.0 \times 10^{-4}$ $m^2$/sec / 0.20 in = 1.96 cm/sec).
The calculated hydraulic conductivity is then reduced by a factor of 2.4 to represent the hydraulic conductivities expected for long-term conditions (e.g., 1.96 / 2.4 = 0.82 cm/sec).
The reduced hydraulic conductivity is shown in parentheses.
6. The value shown for the hydraulic conductivity of the geomembrane is selected based on recommendations from the *HELP's User Guide V.3* [Schroeder et al., 1994a] and Geosyntec's professional experience.
7. Pinhole density, the number of manufacturing defects (diameter of hole equal to or smaller than the geomembrane thickness), is taken to be 2 per unit acre (indicative of good geomembrane quality).
8. Installation defects per unit acre is taken to be 2 (indicative of good installation quality).
9. Installation defects per unit acre is taken to be 2 (indicative of good installation quality).
9. The thickness for the engineered turf layer represents the combined thickness of the synthetic turf, sand infill, and woven geotextile.
10. The hydraulic conductivity of the engineered turf layer was selected based on the manufacturer's design guidelines.
11. A typical value of in-plane hydraulic transmissivity of the Gripnet layer is $2.5 \times 10^{-3}$ $m^2$/sec according to the manufacturer's design guidelines.
12. The hydraulic conductivity of the Gripnet layer was calculated by dividing the typical in-plane hydraulic transmissivity value from manufacturer by the thickness of the layer.
(i.e., $2.5 \times 10^{-3}$ $m^2$/sec / 0.13 in = 75.71 cm/sec for the gripnet layer).
The calculated hydraulic conductivity is then reduced by a factor of 2.4 to represent the hydraulic conductivities expected for long-term conditions (e.g., 75.71 / 2.4 = 31.55 cm/sec).
The reduced hydraulic conductivity is shown in parentheses.

**Table 2. HELP Analysis Results – Peak daily values**

| | Peak Daily Values for Year 1 through 30 | | | | | | |
|---|---|---|---|---|---|---|---|
| | Standard Final Cover System (Option 1) | | | ClosureTurf® Final Cover System (Option 3) | | | Change from Option 1 to Option 3 |
| | *Inches* | *Cubic Feet* | *Percent* | *Inches* | *Cubic Feet* | *Percent* | *Percent* |
| **Precipitation** | 5.3 | 19,312 | 100 | 5.3 | 19,312 | 100 | - |
| **Runoff** | 2.8 | 10,011 | 52 | 4.1 | 15,031 | 78 | + 50.1 |
| **Lateral Drainage Collected Layer 2** | 0.9 | 3,287 | 17 | 1.6 | 5,653 | 29 | + 72.0 |
| **Percolation/Leakage through Layer 4** | 0.000005 | 0.01744 | 0 | 0.000000 | 0.00101 | 0 | - 94.2 |
| **Average Head on Top of Layer 3** | 0.065 | - | - | 0.003 | - | - | - 95.4 |
| **Maximum Head on Top of Layer 3** | 0.126 | - | - | 0.005 | - | - | - 96.0 |

**Table 3. HELP Analysis Results – Average Annual Values**

| | Average Annuals for Year 1 through 30 | | | | | | |
|---|---|---|---|---|---|---|---|
| | Standard Final Cover System (Option 1) | | | ClosureTurf® Final Cover System (Option 3) | | | Change from Option 1 to Option 3 |
| | *Inches* | *Cubic Feet* | *Percent* | *Inches* | *Cubic Feet* | *Percent* | *Percent* |
| **Precipitation** | 50.6 | 183,580 | 100 | 50.6 | 183,580 | 100 | - |
| **Runoff** | 5.0 | 18,223 | 10 | 10.9 | 39,675 | 22 | + 117.7 |
| **Evapotranspiration** | 36.9 | 134,116 | 73 | 11.2 | 40,792 | 22 | - 69.6 |
| **Lateral Drainage Collected Layer 2** | 8.6 | 31,279 | 17 | 28.4 | 103,115 | 56 | + 229.7 |
| **Percolation/Leakage through Layer 4** | 0.00006 | 0.213 | 0 | 0.00001 | 0.024 | 0 | - 88.7 |
| **Average Head on Top of Layer 3** | 0.00200 | - | - | 0.00000 | - | - | - 100 |

Written by: V. Taukoor Date: 04/27/2020 Reviewed by: S. M. Graves Date:

Client: Santee Cooper Project: Winyah Generating Station Project No.: GSC5242 Task No.: 20BT

**Table 4. HELP Analysis Results – Average Monthly Values**

| | | Average Monthly Values for Year 1 through 30 (inches) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | *Jan* | *Feb* | *Mar* | *Apr* | *May* | *Jun* | *Jul* | *Aug* | *Sep* | *Oct* | *Nov* | *Dec* |
| **Standard Final Cover System (Option 1)** | **Precipitation** | 2.5 | 3.6 | 4.7 | 2.7 | 4.2 | 6.0 | 7.2 | 7.3 | 4.8 | 2.7 | 2.0 | 2.9 |
| | **Runoff** | 0.1 | 0.2 | 0.4 | 0.1 | 0.4 | 0.8 | 0.9 | 0.9 | 0.5 | 0.4 | 0.1 | 0.2 |
| | **Evapotranspiration** | 1.8 | 2.2 | 3.4 | 3.3 | 3.8 | 4.6 | 5.2 | 5.2 | 3.7 | 1.8 | 0.9 | 1.1 |
| | **Lateral Drainage Collected Layer 2** | 1.2 | 1.0 | 1.3 | 0.3 | 0.2 | 0.3 | 0.5 | 0.9 | 0.7 | 0.7 | 0.5 | 1.0 |
| | **Percolation/Leakage through Layer 4** | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | **Average Head on Top of Layer 3** | 2.7E-03 | 2.6E-03 | 3.1E-03 | 8.0E-04 | 4.0E-04 | 8.0E-04 | 1.2E-03 | 2.0E-03 | 1.7E-03 | 1.6E-03 | 1.1E-03 | 2.2E-03 |
| **ClosureTurf® Final Cover System (Option 3)** | **Precipitation** | 2.5 | 3.6 | 4.7 | 2.7 | 4.2 | 6.0 | 7.2 | 7.3 | 4.8 | 2.7 | 2.0 | 2.9 |
| | **Runoff** | 0.3 | 0.5 | 0.9 | 0.4 | 1.0 | 1.6 | 1.9 | 1.9 | 1.1 | 0.7 | 0.2 | 0.4 |
| | **Evapotranspiration** | 0.6 | 0.8 | 1.1 | 0.7 | 0.9 | 1.3 | 1.8 | 1.6 | 1.0 | 0.4 | 0.4 | 0.5 |
| | **Lateral Drainage Collected Layer 2** | 1.6 | 2.3 | 2.7 | 1.7 | 2.3 | 3.0 | 3.5 | 3.7 | 2.7 | 1.6 | 1.4 | 1.9 |
| | **Percolation/Leakage through Layer 4** | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | **Average Head on Top of Layer 3** | 1.0E-04 | 2.0E-04 | 2.0E-04 | 1.0E-04 | 2.0E-04 | 2.0E-04 | 3.0E-04 | 3.0E-04 | 2.0E-04 | 1.0E-04 | 1.0E-04 | 1.0E-04 |

# FIGURES

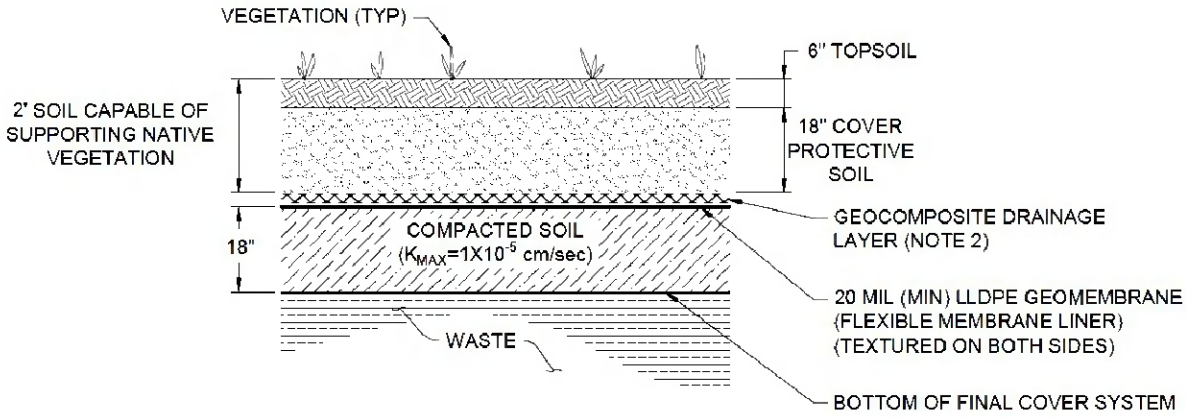



**Figure 1. Cross-section of standard final cover system at Winyah Generating Station (Option 1)**

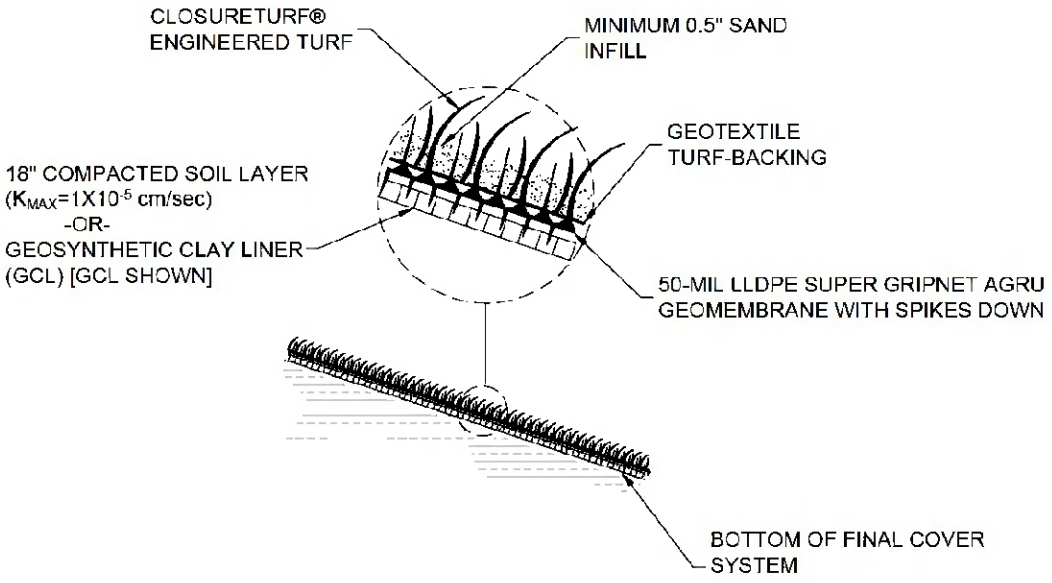



**Figure 2. Cross-section of proposed ClosureTurf® final cover system at Winyah Generating Station (Option 3)**

# APPENDIX A

# HELP RESULTS OF OPTION 1

# (PERMIT STANDARD FINAL COVER SYSTEM)

```
♠
*******************************************************************************
*******************************************************************************
**                                                                           **
**                                                                           **
**            HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE                  **
**              HELP MODEL VERSION 3.07  (1 NOVEMBER 1997)                   **
**                DEVELOPED BY ENVIRONMENTAL LABORATORY                      **
**                  USAE WATERWAYS EXPERIMENT STATION                        **
**           FOR USEPA RISK REDUCTION ENGINEERING LABORATORY                 **
**                                                                           **
**                                                                           **
*******************************************************************************
*******************************************************************************


PRECIPITATION DATA FILE:    C:\DATA4-1.D4
TEMPERATURE DATA FILE:      C:\DATA7-1.D7
SOLAR RADIATION DATA FILE:  C:\DATA13-1.D13
EVAPOTRANSPIRATION DATA:    C:\DATA11-1.D11
SOIL AND DESIGN DATA FILE:  C:\DATA10-1.D10
OUTPUT DATA FILE:           C:\OUT-1.OUT


TIME:  15:43     DATE:   5/ 4/2020


*******************************************************************************

     TITLE:  OPTION1

*******************************************************************************


     NOTE:  INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
            COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.


                                LAYER  1
                                --------

                  TYPE 1 - VERTICAL PERCOLATION LAYER
                      MATERIAL TEXTURE NUMBER  10
          THICKNESS                   =     24.00   INCHES
          POROSITY                    =      0.3980 VOL/VOL
          FIELD CAPACITY              =      0.2440 VOL/VOL
          WILTING POINT               =      0.1360 VOL/VOL
          INITIAL SOIL WATER CONTENT  =      0.3210 VOL/VOL
          EFFECTIVE SAT. HYD. COND.   =  0.119999997000E-03 CM/SEC
     NOTE:  SATURATED HYDRAULIC CONDUCTIVITY IS MULTIPLIED BY  3.00
            FOR ROOT CHANNELS IN TOP HALF OF EVAPORATIVE ZONE.


                                LAYER  2
                                --------

                  TYPE 2 - LATERAL DRAINAGE LAYER
                      MATERIAL TEXTURE NUMBER   0
          THICKNESS                   =     0.20   INCHES
          POROSITY                    =     0.8500 VOL/VOL
          FIELD CAPACITY              =     0.0100 VOL/VOL
          WILTING POINT               =     0.0050 VOL/VOL
          INITIAL SOIL WATER CONTENT  =     0.0203 VOL/VOL
          EFFECTIVE SAT. HYD. COND.   =  0.819999993000     CM/SEC
          SLOPE                       =    33.00   PERCENT
          DRAINAGE LENGTH             =   100.0    FEET


                                LAYER  3
                                --------

                  TYPE 4 - FLEXIBLE MEMBRANE LINER
                      MATERIAL TEXTURE NUMBER  36
          THICKNESS                   =     0.02   INCHES
          POROSITY                    =     0.0000 VOL/VOL
          FIELD CAPACITY              =     0.0000 VOL/VOL
          WILTING POINT               =     0.0000 VOL/VOL
          INITIAL SOIL WATER CONTENT  =     0.0000 VOL/VOL
          EFFECTIVE SAT. HYD. COND.   =  0.399999993000E-12 CM/SEC
          FML PINHOLE DENSITY         =     2.00   HOLES/ACRE
          FML INSTALLATION DEFECTS    =     2.00   HOLES/ACRE
          FML PLACEMENT QUALITY       =  3 - GOOD


                                LAYER  4
                                --------

                  TYPE 3 - BARRIER SOIL LINER
                      MATERIAL TEXTURE NUMBER   0
          THICKNESS                   =    18.00   INCHES
          POROSITY                    =     0.4270 VOL/VOL
          FIELD CAPACITY              =     0.4180 VOL/VOL
          WILTING POINT               =     0.3670 VOL/VOL
          INITIAL SOIL WATER CONTENT  =     0.4270 VOL/VOL
          EFFECTIVE SAT. HYD. COND.   =  0.999999975000E-05 CM/SEC


                  GENERAL DESIGN AND EVAPORATIVE ZONE DATA
                  ---------------------------------------

     NOTE:  SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT
            SOIL DATA BASE USING SOIL TEXTURE #10 WITH A
            FAIR STAND OF GRASS, A SURFACE SLOPE OF 33.%
            AND A SLOPE LENGTH OF  100. FEET.

     SCS RUNOFF CURVE NUMBER             =    87.40
     FRACTION OF AREA ALLOWING RUNOFF    =   100.0    PERCENT
     AREA PROJECTED ON HORIZONTAL PLANE  =     1.000  ACRES
     EVAPORATIVE ZONE DEPTH              =    22.0    INCHES
     INITIAL WATER IN EVAPORATIVE ZONE   =     7.119  INCHES
     UPPER LIMIT OF EVAPORATIVE STORAGE  =     8.756  INCHES
     LOWER LIMIT OF EVAPORATIVE STORAGE  =     2.992  INCHES
     INITIAL SNOW WATER                  =     0.000  INCHES
     INITIAL WATER IN LAYER MATERIALS    =    15.394  INCHES
     TOTAL INITIAL WATER                 =    15.394  INCHES
     TOTAL SUBSURFACE INFLOW             =     0.00   INCHES/YEAR


                  EVAPOTRANSPIRATION AND WEATHER DATA
                  -----------------------------------

     NOTE:  EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
            CHARLESTON              SOUTH CAROLINA

        STATION LATITUDE                  =  32.90 DEGREES
        MAXIMUM LEAF AREA INDEX           =   2.00
        START OF GROWING SEASON (JULIAN DATE)  =   59
        END OF GROWING SEASON (JULIAN DATE)    =  336
        EVAPORATIVE ZONE DEPTH            =  22.0  INCHES
        AVERAGE ANNUAL WIND SPEED         =   8.70 MPH
        AVERAGE 1ST QUARTER RELATIVE HUMIDITY  =  70.00 %
        AVERAGE 2ND QUARTER RELATIVE HUMIDITY  =  74.00 %
        AVERAGE 3RD QUARTER RELATIVE HUMIDITY  =  80.00 %
        AVERAGE 4TH QUARTER RELATIVE HUMIDITY  =  75.00 %


     NOTE:  PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING
            COEFFICIENTS FOR    CHARLESTON           SOUTH CAROLINA

            NORMAL MEAN MONTHLY PRECIPITATION (INCHES)

     JAN/JUL    FEB/AUG    MAR/SEP    APR/OCT    MAY/NOV    JUN/DEC
     -------    -------    -------    -------    -------    -------
        3.33       3.37       4.38       2.58       4.41       6.54
        7.33       6.50       4.94       2.92       2.10       3.11


     NOTE:  TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
            COEFFICIENTS FOR    CHARLESTON           SOUTH CAROLINA

            NORMAL MEAN MONTHLY TEMPERATURE (DEGREES FAHRENHEIT)

     JAN/JUL    FEB/AUG    MAR/SEP    APR/OCT    MAY/NOV    JUN/DEC
     -------    -------    -------    -------    -------    -------
       47.90      49.80      56.70      64.30      72.20      77.60
       80.50      80.00      75.70      65.80      56.70      50.00


     NOTE:  SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
            COEFFICIENTS FOR    CHARLESTON           SOUTH CAROLINA
              AND STATION LATITUDE  =  32.90 DEGREES

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                  MONTHLY TOTALS (IN INCHES) FOR YEAR    1
-------------------------------------------------------------------------------

                          JAN/JUL FEB/AUG MAR/SEP APR/OCT MAY/NOV JUN/DEC
                          ------- ------- ------- ------- ------- -------
PRECIPITATION              1.33    1.60    4.13    1.44    2.39   11.62
                           7.75    7.92    6.08    2.65    1.49    7.85

RUNOFF                     0.000   0.000   0.150   0.001   0.011   2.106
                           0.839   0.816   0.654   0.106   0.006   0.769
```

| | | | | | | |
|---|---|---|---|---|---|---|
| EVAPOTRANSPIRATION | 1.845 | 2.031 | 3.072 | 1.965 | 3.264 | 5.472 |
| | 6.826 | 5.581 | 4.699 | 1.907 | 0.940 | 1.384 |
| LATERAL DRAINAGE COLLECTED | 1.6365 | 0.0016 | 1.1252 | 0.0058 | 0.0000 | 0.3692 |
| FROM LAYER 2 | 1.0278 | 0.7867 | 1.3435 | 1.3746 | 0.1246 | 4.0875 |
| PERCOLATION/LEAKAGE THROUGH | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON | 0.004 | 0.000 | 0.003 | 0.000 | 0.000 | 0.001 |
| TOP OF LAYER 3 | 0.002 | 0.002 | 0.003 | 0.003 | 0.000 | 0.010 |
| STD. DEVIATION OF DAILY | 0.006 | 0.000 | 0.003 | 0.000 | 0.000 | 0.005 |
| HEAD ON TOP OF LAYER 3 | 0.004 | 0.002 | 0.004 | 0.005 | 0.000 | 0.011 |

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ANNUAL TOTALS FOR YEAR 1

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 56.25 | 204187.469 | 100.00 |
| RUNOFF | 5.459 | 19816.215 | 9.70 |
| EVAPOTRANSPIRATION | 38.987 | 141521.906 | 69.31 |
| DRAINAGE COLLECTED FROM LAYER 2 | 11.8029 | 42844.371 | 20.98 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000079 | 0.285 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0023 | | |
| CHANGE IN WATER STORAGE | 0.001 | 4.698 | 0.00 |
| SOIL WATER AT START OF YEAR | 15.394 | 55880.027 | |
| SOIL WATER AT END OF YEAR | 15.395 | 55884.723 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | -0.006 | 0.00 |

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ANNUAL TOTALS FOR YEAR 2

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 55.50 | 201465.031 | 100.00 |
| RUNOFF | 7.272 | 26398.555 | 13.10 |
| EVAPOTRANSPIRATION | 38.303 | 139039.766 | 69.01 |
| DRAINAGE COLLECTED FROM LAYER 2 | 11.7380 | 42608.762 | 21.15 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000078 | 0.284 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0023 | | |
| CHANGE IN WATER STORAGE | -1.813 | -6582.373 | -3.27 |
| SOIL WATER AT START OF YEAR | 15.395 | 55884.723 | |
| SOIL WATER AT END OF YEAR | 13.582 | 49302.352 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | 0.029 | 0.00 |

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MONTHLY TOTALS (IN INCHES) FOR YEAR 3

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 9.55 | 3.03 | 2.48 | 1.04 | 2.20 | 11.50 |
| | 17.18 | 7.61 | 10.13 | 1.38 | 1.84 | 2.61 |
| RUNOFF | 1.011 | 0.059 | 0.028 | 0.024 | 0.000 | 3.086 |
| | 4.474 | 1.310 | 2.531 | 0.008 | 0.007 | 0.001 |
| EVAPOTRANSPIRATION | 1.937 | 2.450 | 3.210 | 1.933 | 2.309 | 5.130 |
| | 7.233 | 6.151 | 4.294 | 2.570 | 1.134 | 0.988 |
| LATERAL DRAINAGE COLLECTED | 5.2842 | 1.4866 | 1.0519 | 0.0067 | 0.0002 | 0.0802 |
| FROM LAYER 2 | 4.1416 | 2.8831 | 1.7586 | 0.9186 | 0.0138 | 0.3833 |
| PERCOLATION/LEAKAGE THROUGH | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON | 0.012 | 0.004 | 0.002 | 0.000 | 0.000 | 0.000 |
| TOP OF LAYER 3 | 0.010 | 0.007 | 0.004 | 0.002 | 0.000 | 0.001 |
| STD. DEVIATION OF DAILY | 0.010 | 0.003 | 0.002 | 0.000 | 0.000 | 0.001 |
| HEAD ON TOP OF LAYER 3 | 0.010 | 0.008 | 0.005 | 0.001 | 0.000 | 0.001 |

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MONTHLY TOTALS (IN INCHES) FOR YEAR 2

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 1.94 | 3.81 | 5.11 | 6.07 | 9.80 | 6.74 |
| | 8.57 | 1.23 | 7.94 | 1.92 | 1.34 | 1.03 |
| RUNOFF | 0.079 | 0.183 | 0.887 | 0.377 | 2.260 | 0.929 |
| | 1.142 | 0.000 | 1.401 | 0.007 | 0.000 | 0.000 |
| EVAPOTRANSPIRATION | 1.576 | 2.143 | 3.493 | 4.305 | 4.881 | 6.484 |
| | 5.569 | 2.989 | 3.011 | 1.907 | 0.941 | 1.004 |
| LATERAL DRAINAGE COLLECTED | 1.6389 | 1.4314 | 1.9028 | 0.1615 | 2.1941 | 2.6305 |
| FROM LAYER 2 | 0.0068 | 0.0006 | 1.3936 | 0.3094 | 0.0051 | 0.0633 |
| PERCOLATION/LEAKAGE THROUGH | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON | 0.004 | 0.004 | 0.004 | 0.000 | 0.005 | 0.006 |
| TOP OF LAYER 3 | 0.000 | 0.000 | 0.003 | 0.001 | 0.000 | 0.000 |
| STD. DEVIATION OF DAILY | 0.006 | 0.003 | 0.004 | 0.001 | 0.009 | 0.009 |
| HEAD ON TOP OF LAYER 3 | 0.000 | 0.000 | 0.008 | 0.001 | 0.000 | 0.000 |

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ANNUAL TOTALS FOR YEAR 3

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 70.63 | 256386.891 | 100.00 |
| RUNOFF | 12.539 | 45516.184 | 17.75 |
| EVAPOTRANSPIRATION | 39.338 | 142796.922 | 55.70 |
| DRAINAGE COLLECTED FROM LAYER 2 | 18.0088 | 65371.785 | 25.50 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000118 | 0.427 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0035 | | |
| CHANGE IN WATER STORAGE | 0.744 | 2701.528 | 1.05 |
| SOIL WATER AT START OF YEAR | 13.582 | 49302.352 | |

| | | | |
|---|---|---|---|
| SOIL WATER AT END OF YEAR | 14.326 | 52003.879 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | 0.047 | 0.00 |

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MONTHLY TOTALS (IN INCHES) FOR YEAR 4

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 3.35 | 4.24 | 2.43 | 2.92 | 3.58 | 4.01 |
| | 6.62 | 3.89 | 6.00 | 1.40 | 1.58 | 1.23 |
| RUNOFF | 0.234 | 0.203 | 0.051 | 0.002 | 0.017 | 0.032 |
| | 0.223 | 0.309 | 0.293 | 0.064 | 0.002 | 0.000 |
| EVAPOTRANSPIRATION | 1.690 | 2.267 | 3.139 | 4.132 | 3.939 | 4.205 |
| | 5.844 | 4.241 | 3.193 | 1.976 | 0.928 | 1.152 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 2.2650 | 0.9089 | 0.4592 | 0.0013 | 0.0157 | 0.0014 |
| | 0.0172 | 0.0000 | 0.0037 | 0.7096 | 0.0067 | 0.0035 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.005 | 0.002 | 0.001 | 0.000 | 0.000 | 0.000 |
| | 0.000 | 0.000 | 0.000 | 0.002 | 0.000 | 0.000 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.003 | 0.002 | 0.001 | 0.000 | 0.000 | 0.000 |
| | 0.000 | 0.000 | 0.000 | 0.002 | 0.000 | 0.000 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 9.84 | 9.38 | 3.97 | 4.42 | 1.76 | 2.09 |
| RUNOFF | 0.000 | 0.294 | 0.975 | 0.004 | 1.762 | 0.000 |
| | 0.980 | 0.994 | 0.113 | 1.151 | 0.000 | 0.001 |
| EVAPOTRANSPIRATION | 1.790 | 2.219 | 3.488 | 3.068 | 5.696 | 1.303 |
| | 6.758 | 5.451 | 4.679 | 2.176 | 1.165 | 1.166 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 0.0018 | 0.0000 | 2.9426 | 1.4675 | 1.7979 | 0.1221 |
| | 1.0535 | 0.1678 | 0.9159 | 0.9514 | 0.1918 | 0.8961 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.000 | 0.007 | 0.004 | 0.004 | 0.000 |
| | 0.002 | 0.000 | 0.002 | 0.002 | 0.000 | 0.002 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.000 | 0.006 | 0.005 | 0.009 | 0.001 |
| | 0.005 | 0.001 | 0.003 | 0.003 | 0.001 | 0.002 |

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ANNUAL TOTALS FOR YEAR 5

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 56.51 | 205131.203 | 100.00 |
| RUNOFF | 6.273 | 22769.566 | 11.10 |
| EVAPOTRANSPIRATION | 38.958 | 141416.922 | 68.94 |
| DRAINAGE COLLECTED FROM LAYER 2 | 10.5083 | 38145.023 | 18.60 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000070 | 0.255 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0021 | | |
| CHANGE IN WATER STORAGE | 0.771 | 2799.481 | 1.36 |

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ANNUAL TOTALS FOR YEAR 4

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 41.25 | 149737.500 | 100.00 |
| RUNOFF | 1.431 | 5195.175 | 3.47 |
| EVAPOTRANSPIRATION | 36.706 | 133242.625 | 88.98 |
| DRAINAGE COLLECTED FROM LAYER 2 | 4.3921 | 15943.407 | 10.65 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000033 | 0.118 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0009 | | |
| CHANGE IN WATER STORAGE | -1.279 | -4643.882 | -3.10 |
| SOIL WATER AT START OF YEAR | 14.326 | 52003.879 | |
| SOIL WATER AT END OF YEAR | 13.047 | 47359.996 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | 0.064 | 0.00 |

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MONTHLY TOTALS (IN INCHES) FOR YEAR 5

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 1.26 | 3.46 | 9.26 | 2.23 | 8.35 | 0.49 |

| | | | |
|---|---|---|---|
| SOIL WATER AT START OF YEAR | 13.047 | 47359.996 | |
| SOIL WATER AT END OF YEAR | 13.818 | 50159.477 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | -0.033 | 0.00 |

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MONTHLY TOTALS (IN INCHES) FOR YEAR 6

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 2.46 | 2.46 | 2.01 | 4.27 | 3.35 | 11.39 |
| | 5.46 | 7.83 | 2.46 | 5.63 | 0.79 | 4.84 |
| RUNOFF | 0.006 | 0.015 | 0.003 | 0.082 | 0.090 | 2.055 |
| | 0.020 | 0.515 | 0.030 | 1.110 | 0.000 | 0.393 |
| EVAPOTRANSPIRATION | 1.668 | 2.458 | 3.324 | 4.229 | 3.026 | 6.539 |
| | 5.404 | 6.013 | 2.741 | 1.750 | 0.946 | 1.017 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 0.9380 | 0.2412 | 0.0036 | 0.3100 | 0.0005 | 2.6634 |
| | 0.1552 | 0.1434 | 0.1539 | 1.2403 | 0.6875 | 2.2359 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.002 | 0.001 | 0.000 | 0.001 | 0.000 | 0.006 |
| | 0.000 | 0.000 | 0.000 | 0.003 | 0.002 | 0.005 |
| STD. DEVIATION OF DAILY | 0.002 | 0.001 | 0.000 | 0.001 | 0.000 | 0.006 |

| | | | | | | |
|---|---|---|---|---|---|---|
| HEAD ON TOP OF LAYER 3 | 0.001 | 0.001 | 0.001 | 0.008 | 0.001 | 0.008 |

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ANNUAL TOTALS FOR YEAR 6

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 52.95 | 192208.547 | 100.00 |
| RUNOFF | 4.318 | 15673.318 | 8.15 |
| EVAPOTRANSPIRATION | 39.115 | 141988.937 | 73.87 |
| DRAINAGE COLLECTED FROM LAYER 2 | 8.7729 | 31845.744 | 16.57 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000060 | 0.218 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0017 | | |
| CHANGE IN WATER STORAGE | 0.744 | 2700.292 | 1.40 |
| SOIL WATER AT START OF YEAR | 13.818 | 50159.477 | |
| SOIL WATER AT END OF YEAR | 14.562 | 52859.770 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | 0.035 | 0.00 |

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MONTHLY TOTALS (IN INCHES) FOR YEAR 7

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 1.05 | 2.32 | 6.14 | 2.84 | 2.24 | 1.23 |
| | 3.66 | 7.88 | 5.64 | 2.29 | 3.25 | 3.14 |
| RUNOFF | 0.000 | 0.066 | 1.302 | 0.034 | 0.000 | 0.000 |
| | 0.067 | 1.096 | 0.289 | 0.054 | 0.091 | 0.203 |
| EVAPOTRANSPIRATION | 1.815 | 1.864 | 3.791 | 4.105 | 2.720 | 1.159 |
| | 2.783 | 6.177 | 4.313 | 2.037 | 1.117 | 1.317 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 0.9172 | 0.0157 | 1.2231 | 0.1083 | 0.0224 | 0.0004 |
| | 0.0001 | 0.0607 | 0.7235 | 0.0340 | 0.0570 | 1.7804 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.002 | 0.000 | 0.003 | 0.000 | 0.000 | 0.000 |
| | 0.000 | 0.000 | 0.002 | 0.000 | 0.000 | 0.004 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.002 | 0.000 | 0.004 | 0.000 | 0.000 | 0.000 |
| | 0.000 | 0.000 | 0.002 | 0.000 | 0.001 | 0.004 |

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ANNUAL TOTALS FOR YEAR 7

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 41.68 | 151298.375 | 100.00 |
| RUNOFF | 3.202 | 11623.628 | 7.68 |
| EVAPOTRANSPIRATION | 33.198 | 120509.055 | 79.65 |
| DRAINAGE COLLECTED FROM LAYER 2 | 4.9509 | 17971.682 | 11.88 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000036 | 0.132 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0010 | | |
| CHANGE IN WATER STORAGE | 0.329 | 1193.912 | 0.79 |
| SOIL WATER AT START OF YEAR | 14.562 | 52859.770 | |
| SOIL WATER AT END OF YEAR | 14.891 | 54053.684 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | -0.032 | 0.00 |

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MONTHLY TOTALS (IN INCHES) FOR YEAR 8

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 1.62 | 2.94 | 3.39 | 5.95 | 3.46 | 3.91 |
| | 4.25 | 5.99 | 5.46 | 2.54 | 1.26 | 3.58 |
| RUNOFF | 0.647 | 0.219 | 0.103 | 0.852 | 0.002 | 0.138 |
| | 0.025 | 0.304 | 1.401 | 0.590 | 0.000 | 0.079 |
| EVAPOTRANSPIRATION | 1.804 | 1.649 | 3.416 | 4.992 | 4.235 | 3.788 |
| | 4.310 | 5.539 | 1.114 | 1.779 | 0.986 | 1.112 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 1.9983 | 0.0004 | 0.0047 | 0.7380 | 0.1785 | 0.0008 |
| | 0.0008 | 0.0004 | 0.0143 | 1.7927 | 0.0229 | 1.2624 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.005 | 0.000 | 0.000 | 0.002 | 0.000 | 0.000 |
| | 0.000 | 0.000 | 0.000 | 0.004 | 0.000 | 0.003 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.010 | 0.000 | 0.000 | 0.003 | 0.001 | 0.000 |
| | 0.000 | 0.000 | 0.000 | 0.004 | 0.000 | 0.005 |

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ANNUAL TOTALS FOR YEAR 8

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 44.35 | 160990.531 | 100.00 |
| RUNOFF | 4.359 | 15823.972 | 9.83 |
| EVAPOTRANSPIRATION | 34.725 | 126052.992 | 78.30 |
| DRAINAGE COLLECTED FROM LAYER 2 | 6.0145 | 21832.687 | 13.56 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000041 | 0.149 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0012 | | |
| CHANGE IN WATER STORAGE | -0.749 | -2719.322 | -1.69 |
| SOIL WATER AT START OF YEAR | 14.891 | 54053.684 | |
| SOIL WATER AT END OF YEAR | 14.142 | 51334.359 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | 0.059 | 0.00 |

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MONTHLY TOTALS (IN INCHES) FOR YEAR 9

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 4.90 | 2.07 | 5.76 | 3.18 | 3.96 | 3.45 |
| | 7.17 | 11.97 | 3.97 | 1.01 | 3.96 | 2.50 |
| RUNOFF | 0.104 | 0.021 | 0.401 | 0.005 | 0.156 | 0.094 |
| | 0.919 | 2.440 | 0.206 | 0.000 | 0.207 | 0.253 |
| EVAPOTRANSPIRATION | 1.965 | 2.019 | 3.574 | 3.433 | 3.655 | 3.513 |
| | 5.508 | 5.595 | 4.044 | 1.577 | 0.981 | 0.999 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 3.4925 | 0.2041 | 2.2896 | 0.1918 | 0.0063 | 0.0008 |
| | 0.0013 | 2.5952 | 0.8860 | 0.0031 | 0.0000 | 1.7831 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.008 | 0.001 | 0.005 | 0.000 | 0.000 | 0.000 |
| | 0.000 | 0.006 | 0.002 | 0.000 | 0.000 | 0.004 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.005 | 0.001 | 0.005 | 0.001 | 0.000 | 0.000 |
| | 0.000 | 0.009 | 0.002 | 0.000 | 0.000 | 0.003 |

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ANNUAL TOTALS FOR YEAR 9

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 53.90 | 195656.953 | 100.00 |
| RUNOFF | 4.888 | 17742.715 | 9.07 |
| EVAPOTRANSPIRATION | 37.665 | 136725.359 | 69.88 |
| DRAINAGE COLLECTED FROM LAYER 2 | 11.5338 | 41867.766 | 21.40 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000077 | 0.279 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0023 | | |
| CHANGE IN WATER STORAGE | -0.187 | -679.088 | -0.35 |
| SOIL WATER AT START OF YEAR | 14.142 | 51334.359 | |
| SOIL WATER AT END OF YEAR | 13.955 | 50655.273 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | -0.072 | 0.00 |

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MONTHLY TOTALS (IN INCHES) FOR YEAR 10

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 2.47 | 1.15 | 6.47 | 0.52 | 4.72 | 6.44 |
| | 7.41 | 11.47 | 5.30 | 0.47 | 1.24 | 2.16 |
| RUNOFF | 0.013 | 0.000 | 0.587 | 0.000 | 0.042 | 0.265 |
| | 0.944 | 2.522 | 0.310 | 0.000 | 0.000 | 0.004 |
| EVAPOTRANSPIRATION | 1.992 | 2.128 | 3.663 | 2.568 | 3.673 | 6.088 |
| | 5.813 | 5.582 | 4.148 | 1.720 | 0.916 | 0.934 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 0.9207 | 0.3222 | 0.5260 | 0.4237 | 0.0013 | 0.0009 |
| | 0.5224 | 0.6507 | 2.9951 | 0.0002 | 0.0000 | 0.0001 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.002 | 0.001 | 0.001 | 0.001 | 0.000 | 0.000 |
| | 0.001 | 0.002 | 0.007 | 0.000 | 0.000 | 0.000 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.001 | 0.001 | 0.002 | 0.001 | 0.000 | 0.000 |
| | 0.002 | 0.007 | 0.009 | 0.000 | 0.000 | 0.000 |

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ANNUAL TOTALS FOR YEAR 10

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 49.82 | 180846.641 | 100.00 |
| RUNOFF | 4.687 | 17012.680 | 9.41 |
| EVAPOTRANSPIRATION | 39.226 | 142390.906 | 78.74 |
| DRAINAGE COLLECTED FROM LAYER 2 | 6.3634 | 23099.162 | 12.77 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000044 | 0.160 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0013 | | |
| CHANGE IN WATER STORAGE | -0.456 | -1656.296 | -0.92 |
| SOIL WATER AT START OF YEAR | 13.955 | 50655.273 | |
| SOIL WATER AT END OF YEAR | 13.498 | 48998.977 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | 0.022 | 0.00 |

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MONTHLY TOTALS (IN INCHES) FOR YEAR 11

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 5.32 | 2.54 | 3.82 | 0.91 | 5.01 | 7.46 |
| | 9.21 | 2.68 | 1.58 | 0.94 | 1.21 | 2.77 |
| RUNOFF | 1.109 | 0.008 | 0.189 | 0.000 | 0.125 | 0.405 |
| | 0.995 | 0.010 | 0.000 | 0.000 | 0.000 | 0.028 |
| EVAPOTRANSPIRATION | 1.884 | 2.192 | 3.685 | 2.760 | 4.309 | 6.457 |
| | 6.632 | 4.160 | 2.170 | 0.937 | 0.410 | 0.811 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 1.6104 | 0.9693 | 0.3960 | 0.0252 | 0.0089 | 0.0006 |
| | 0.7557 | 0.0000 | 0.0008 | 0.0000 | 0.0001 | 0.0000 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.004 | 0.003 | 0.001 | 0.000 | 0.000 | 0.000 |
| | 0.002 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.004 | 0.002 | 0.001 | 0.000 | 0.000 | 0.000 |
| | 0.002 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

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ANNUAL TOTALS FOR YEAR 11

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 43.45 | 157723.516 | 100.00 |
| RUNOFF | 2.870 | 10418.771 | 6.61 |
| EVAPOTRANSPIRATION | 36.408 | 132162.250 | 83.79 |
| DRAINAGE COLLECTED FROM LAYER 2 | 3.7671 | 13674.656 | 8.67 |

| | | | |
|---|---|---|---|
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000028 | 0.101 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0008 | | |
| CHANGE IN WATER STORAGE | 0.404 | 1467.743 | 0.93 |
| SOIL WATER AT START OF YEAR | 13.498 | 48998.977 | |
| SOIL WATER AT END OF YEAR | 13.903 | 50466.719 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | -0.002 | 0.00 |

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MONTHLY TOTALS (IN INCHES) FOR YEAR 12

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 0.93 | 2.85 | 4.08 | 1.31 | 3.74 | 5.97 |
| | 4.46 | 7.69 | 3.09 | 2.13 | 2.12 | 1.53 |
| RUNOFF | 0.000 | 0.151 | 0.399 | 0.000 | 0.250 | 0.449 |
| | 0.002 | 0.776 | 0.134 | 0.061 | 0.118 | 0.000 |
| EVAPOTRANSPIRATION | 1.105 | 1.840 | 3.203 | 2.199 | 4.510 | 5.566 |
| | 4.426 | 4.384 | 4.242 | 1.705 | 0.903 | 1.084 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 0.2561 | 0.5990 | 0.7109 | 0.3764 | 0.0004 | 0.0004 |
| | 0.0006 | 0.0000 | 0.0009 | 0.0001 | 0.0161 | 0.3306 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.001 | 0.001 | 0.002 | 0.001 | 0.000 | 0.000 |
| | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.001 | 0.002 | 0.003 | 0.001 | 0.000 | 0.000 |
| | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 |

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ANNUAL TOTALS FOR YEAR 12

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 39.90 | 144837.000 | 100.00 |
| RUNOFF | 2.340 | 8494.564 | 5.86 |
| EVAPOTRANSPIRATION | 35.167 | 127657.828 | 88.14 |
| DRAINAGE COLLECTED FROM LAYER 2 | 2.2914 | 8317.768 | 5.74 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000018 | 0.066 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0005 | | |
| CHANGE IN WATER STORAGE | 0.101 | 366.809 | 0.25 |
| SOIL WATER AT START OF YEAR | 13.903 | 50466.719 | |
| SOIL WATER AT END OF YEAR | 14.004 | 50833.527 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | -0.032 | 0.00 |

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MONTHLY TOTALS (IN INCHES) FOR YEAR 13

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 1.51 | 5.66 | 3.69 | 2.73 | 0.59 | 6.40 |
| | 1.64 | 7.64 | 2.34 | 0.21 | 0.45 | 4.13 |
| RUNOFF | 0.000 | 0.299 | 0.304 | 0.094 | 0.000 | 1.754 |
| | 0.000 | 0.712 | 0.000 | 0.000 | 0.000 | 0.230 |
| EVAPOTRANSPIRATION | 1.783 | 1.933 | 3.408 | 3.797 | 0.837 | 4.169 |
| | 1.618 | 5.112 | 3.948 | 0.316 | 0.309 | 1.167 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 0.4328 | 2.4816 | 1.6378 | 0.0006 | 0.0074 | 0.1874 |
| | 0.0406 | 0.0014 | 0.2303 | 0.0000 | 0.0000 | 0.0000 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.001 | 0.006 | 0.004 | 0.000 | 0.000 | 0.000 |
| | 0.000 | 0.000 | 0.001 | 0.000 | 0.000 | 0.000 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.001 | 0.008 | 0.005 | 0.000 | 0.000 | 0.001 |
| | 0.000 | 0.000 | 0.001 | 0.000 | 0.000 | 0.000 |

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ANNUAL TOTALS FOR YEAR 13

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 36.99 | 134273.687 | 100.00 |
| RUNOFF | 3.393 | 12315.354 | 9.17 |
| EVAPOTRANSPIRATION | 28.396 | 103077.633 | 76.77 |
| DRAINAGE COLLECTED FROM LAYER 2 | 5.0199 | 18222.311 | 13.57 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000035 | 0.126 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0010 | | |
| CHANGE IN WATER STORAGE | 0.181 | 658.282 | 0.49 |
| SOIL WATER AT START OF YEAR | 14.004 | 50833.527 | |
| SOIL WATER AT END OF YEAR | 14.185 | 51491.812 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | -0.014 | 0.00 |

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MONTHLY TOTALS (IN INCHES) FOR YEAR 14

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 0.96 | 1.63 | 6.28 | 1.14 | 6.46 | 3.16 |
| | 4.62 | 5.52 | 5.16 | 0.76 | 0.66 | 3.41 |
| RUNOFF | 0.000 | 0.005 | 0.514 | 0.017 | 0.286 | 0.127 |
| | 0.138 | 0.404 | 0.117 | 0.000 | 0.000 | 0.328 |
| EVAPOTRANSPIRATION | 1.526 | 2.273 | 2.924 | 3.158 | 5.829 | 3.805 |
| | 3.855 | 4.193 | 4.277 | 1.968 | 0.844 | 1.167 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 0.4409 | 0.0011 | 1.1843 | 0.5508 | 0.0059 | 0.0001 |
| | 0.0014 | 0.0000 | 0.0003 | 0.0042 | 0.0000 | 0.6663 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.001<br>0.000 | 0.000<br>0.000 | 0.003<br>0.000 | 0.001<br>0.000 | 0.000<br>0.000 | 0.000<br>0.002 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.001<br>0.000 | 0.000<br>0.000 | 0.007<br>0.000 | 0.002<br>0.000 | 0.000<br>0.000 | 0.000<br>0.002 |

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ANNUAL TOTALS FOR YEAR 14

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 39.76 | 144328.797 | 100.00 |
| RUNOFF | 1.936 | 7026.992 | 4.87 |
| EVAPOTRANSPIRATION | 35.819 | 130024.602 | 90.09 |
| DRAINAGE COLLECTED FROM LAYER 2 | 2.8554 | 10364.968 | 7.18 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000020 | 0.073 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0006 | | |
| CHANGE IN WATER STORAGE | -0.851 | -3087.849 | -2.14 |
| SOIL WATER AT START OF YEAR | 14.185 | 51491.812 | |
| SOIL WATER AT END OF YEAR | 13.334 | 48403.961 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | 0.004 | 0.00 |

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| | | | | | | |
|---|---|---|---|---|---|---|
| EVAPOTRANSPIRATION | 31.151 | 113079.070 | 71.28 | | | |
| DRAINAGE COLLECTED FROM LAYER 2 | 5.9856 | 21727.713 | 13.70 | | | |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000042 | 0.154 | 0.00 | | | |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0012 | | | | | |
| CHANGE IN WATER STORAGE | 0.758 | 2750.797 | 1.73 | | | |
| SOIL WATER AT START OF YEAR | 13.334 | 48403.961 | | | | |
| SOIL WATER AT END OF YEAR | 14.092 | 51154.758 | | | | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 | | | |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 | | | |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | 0.028 | 0.00 | | | |

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MONTHLY TOTALS (IN INCHES) FOR YEAR 16

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 1.75<br>10.04 | 3.05<br>7.93 | 3.09<br>3.34 | 1.70<br>0.77 | 2.01<br>0.86 | 7.29<br>1.77 |
| RUNOFF | 0.008<br>0.900 | 0.048<br>0.440 | 0.058<br>0.037 | 0.094<br>0.000 | 0.030<br>0.000 | 0.596<br>0.000 |
| EVAPOTRANSPIRATION | 1.958<br>6.254 | 2.293<br>5.488 | 3.478<br>4.268 | 2.962<br>1.849 | 2.021<br>0.934 | 4.494<br>0.834 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 0.5776<br>1.7006 | 0.9552<br>1.2433 | 0.0374<br>0.6789 | 0.0000<br>0.0009 | 0.0021<br>0.0003 | 0.9768<br>0.0019 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000<br>0.0000 | 0.0000<br>0.0000 | 0.0000<br>0.0000 | 0.0000<br>0.0000 | 0.0000<br>0.0000 | 0.0000<br>0.0000 |

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MONTHLY TOTALS (IN INCHES) FOR YEAR 15

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 0.66<br>5.96 | 4.46<br>7.78 | 1.62<br>7.59 | 0.16<br>1.32 | 5.79<br>1.54 | 2.55<br>4.27 |
| RUNOFF | 0.000<br>0.352 | 0.066<br>1.491 | 0.000<br>1.356 | 0.000<br>0.001 | 1.829<br>0.028 | 0.026<br>0.656 |
| EVAPOTRANSPIRATION | 1.656<br>3.921 | 2.036<br>6.086 | 3.246<br>2.658 | 1.141<br>1.816 | 2.437<br>1.017 | 3.889<br>1.247 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 0.1606<br>0.0004 | 0.0006<br>1.0903 | 0.7533<br>1.8649 | 0.0062<br>0.3428 | 0.0053<br>0.0076 | 0.1535<br>1.6002 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000<br>0.0000 | 0.0000<br>0.0000 | 0.0000<br>0.0000 | 0.0000<br>0.0000 | 0.0000<br>0.0000 | 0.0000<br>0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.000<br>0.000 | 0.000<br>0.003 | 0.002<br>0.004 | 0.000<br>0.001 | 0.000<br>0.000 | 0.000<br>0.004 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.001<br>0.000 | 0.000<br>0.004 | 0.002<br>0.008 | 0.000<br>0.001 | 0.000<br>0.000 | 0.001<br>0.004 |

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ANNUAL TOTALS FOR YEAR 15

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 43.70 | 158631.000 | 100.00 |
| RUNOFF | 5.805 | 21073.244 | 13.28 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.001<br>0.004 | 0.002<br>0.003 | 0.000<br>0.002 | 0.000<br>0.000 | 0.000<br>0.000 | 0.002<br>0.000 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.001<br>0.004 | 0.002<br>0.005 | 0.000<br>0.002 | 0.000<br>0.000 | 0.000<br>0.000 | 0.005<br>0.000 |

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ANNUAL TOTALS FOR YEAR 16

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 43.60 | 158267.937 | 100.00 |
| RUNOFF | 2.211 | 8026.843 | 5.07 |
| EVAPOTRANSPIRATION | 36.832 | 133699.344 | 84.48 |
| DRAINAGE COLLECTED FROM LAYER 2 | 6.1752 | 22415.945 | 14.16 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000044 | 0.160 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0012 | | |
| CHANGE IN WATER STORAGE | -1.618 | -5874.330 | -3.71 |
| SOIL WATER AT START OF YEAR | 14.092 | 51154.758 | |
| SOIL WATER AT END OF YEAR | 12.474 | 45280.430 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | -0.024 | 0.00 |

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MONTHLY TOTALS (IN INCHES) FOR YEAR 17

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 2.70 | 7.01 | 3.69 | 4.53 | 3.61 | 4.66 |
| | 7.94 | 15.04 | 6.69 | 2.52 | 1.73 | 1.89 |
| RUNOFF | 0.056 | 1.308 | 0.044 | 0.160 | 0.365 | 0.094 |
| | 0.737 | 2.332 | 2.219 | 0.000 | 0.000 | 0.173 |
| EVAPOTRANSPIRATION | 1.207 | 1.862 | 3.674 | 4.063 | 3.709 | 6.335 |
| | 6.587 | 5.983 | 3.837 | 1.936 | 0.779 | 1.013 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 0.9207 | 2.4835 | 1.1998 | 0.0004 | 0.0069 | 0.0009 |
| | 0.0359 | 4.1650 | 3.1573 | 0.0099 | 0.0001 | 0.9390 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.002 | 0.006 | 0.003 | 0.000 | 0.000 | 0.000 |
| | 0.000 | 0.010 | 0.008 | 0.000 | 0.000 | 0.002 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.003 | 0.008 | 0.003 | 0.000 | 0.000 | 0.000 |
| | 0.000 | 0.013 | 0.012 | 0.000 | 0.000 | 0.002 |

ANNUAL TOTALS FOR YEAR 17

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 62.01 | 225096.312 | 100.00 |
| RUNOFF | 7.488 | 27181.236 | 12.08 |
| EVAPOTRANSPIRATION | 40.985 | 148774.812 | 66.09 |
| DRAINAGE COLLECTED FROM LAYER 2 | 12.9194 | 46897.340 | 20.83 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000083 | 0.300 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0026 | | |
| CHANGE IN WATER STORAGE | 0.618 | 2242.592 | 1.00 |
| SOIL WATER AT START OF YEAR | 12.474 | 45280.430 | |
| SOIL WATER AT END OF YEAR | 13.092 | 47523.023 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | 0.022 | 0.00 |

MONTHLY TOTALS (IN INCHES) FOR YEAR 18

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 3.70 | 6.40 | 0.35 | 3.47 | 5.66 | 7.17 |
| | 3.82 | 6.48 | 1.53 | 1.46 | 3.03 | 1.96 |
| RUNOFF | 0.037 | 0.836 | 1.721 | 0.019 | 0.224 | 0.839 |
| | 0.022 | 0.444 | 0.000 | 0.000 | 0.452 | 0.002 |
| EVAPOTRANSPIRATION | 1.799 | 1.874 | 3.762 | 4.485 | 5.196 | 6.480 |
| | 3.806 | 4.985 | 3.818 | 1.417 | 0.668 | 0.979 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 1.2126 | 3.3629 | 3.0175 | 0.4269 | 0.0047 | 0.0023 |
| | 0.0019 | 0.0016 | 0.1227 | 0.0000 | 0.0002 | 0.0033 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.003 | 0.009 | 0.007 | 0.001 | 0.000 | 0.000 |
| | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.004 | 0.009 | 0.009 | 0.001 | 0.000 | 0.000 |
| | 0.000 | 0.000 | 0.001 | 0.000 | 0.000 | 0.000 |

ANNUAL TOTALS FOR YEAR 18

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 53.03 | 192498.875 | 100.00 |
| RUNOFF | 4.596 | 16684.908 | 8.67 |
| EVAPOTRANSPIRATION | 39.269 | 142548.250 | 74.05 |
| DRAINAGE COLLECTED FROM LAYER 2 | 8.1566 | 29608.531 | 15.38 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000054 | 0.195 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0017 | | |
| CHANGE IN WATER STORAGE | 1.007 | 3657.130 | 1.90 |
| SOIL WATER AT START OF YEAR | 13.092 | 47523.023 | |
| SOIL WATER AT END OF YEAR | 14.099 | 51180.152 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | -0.129 | 0.00 |

MONTHLY TOTALS (IN INCHES) FOR YEAR 19

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 1.73 | 4.74 | 3.73 | 1.27 | 1.44 | 3.57 |
| | 8.46 | 10.48 | 7.69 | 0.96 | 4.52 | 2.28 |
| RUNOFF | 0.026 | 0.377 | 0.130 | 0.032 | 0.000 | 0.041 |
| | 0.951 | 1.907 | 0.922 | 1.069 | 0.260 | 0.021 |
| EVAPOTRANSPIRATION | 1.751 | 2.108 | 3.384 | 3.117 | 1.524 | 3.191 |
| | 4.375 | 6.398 | 4.612 | 2.317 | 1.227 | 1.077 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 0.3465 | 2.2204 | 0.2455 | 0.5796 | 0.0001 | 0.0000 |
| | 0.5149 | 3.2198 | 1.6852 | 4.5752 | 2.8909 | 1.5562 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.001 | 0.006 | 0.001 | 0.001 | 0.000 | 0.000 |
| | 0.001 | 0.008 | 0.004 | 0.011 | 0.007 | 0.004 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.001 | 0.004 | 0.001 | 0.002 | 0.000 | 0.000 |
| | 0.004 | 0.009 | 0.006 | 0.010 | 0.010 | 0.003 |

ANNUAL TOTALS FOR YEAR 19

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|

| | | | |
|---|---|---|---|
| PRECIPITATION | 58.87 | 213698.125 | 100.00 |
| RUNOFF | 5.735 | 20818.646 | 9.74 |
| EVAPOTRANSPIRATION | 35.082 | 127346.969 | 59.59 |
| DRAINAGE COLLECTED FROM LAYER 2 | 17.8344 | 64739.047 | 30.29 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000117 | 0.426 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0035 | | |
| CHANGE IN WATER STORAGE | 0.218 | 792.986 | 0.37 |
| SOIL WATER AT START OF YEAR | 14.099 | 51180.152 | |
| SOIL WATER AT END OF YEAR | 14.318 | 51973.137 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | 0.050 | 0.00 |

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MONTHLY TOTALS (IN INCHES) FOR YEAR 20

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 3.86 | 7.49 | 2.34 | 1.19 | 1.53 | 12.61 |
| | 7.41 | 7.62 | 4.70 | 0.11 | 1.96 | 4.50 |
| RUNOFF | 0.216 | 0.633 | 0.000 | 0.000 | 0.000 | 1.789 |
| | 0.880 | 1.157 | 0.383 | 0.000 | 0.000 | 0.310 |
| EVAPOTRANSPIRATION | 1.808 | 2.302 | 3.375 | 2.343 | 1.698 | 5.404 |
| | 7.237 | 6.114 | 4.424 | 1.454 | 0.765 | 1.104 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 2.7457 | 3.5926 | 0.8424 | 0.0014 | 0.0000 | 1.3128 |
| | 2.1979 | 0.0317 | 0.0688 | 0.0000 | 0.0000 | 1.7505 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.006 | 0.009 | 0.002 | 0.000 | 0.000 | 0.003 |
| | 0.005 | 0.000 | 0.000 | 0.000 | 0.000 | 0.004 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.005 | 0.011 | 0.002 | 0.000 | 0.000 | 0.008 |
| | 0.005 | 0.000 | 0.000 | 0.000 | 0.000 | 0.005 |

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ANNUAL TOTALS FOR YEAR 20

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 55.32 | 200811.625 | 100.00 |
| RUNOFF | 5.367 | 19482.340 | 9.70 |
| EVAPOTRANSPIRATION | 38.029 | 138045.125 | 68.74 |
| DRAINAGE COLLECTED FROM LAYER 2 | 12.5440 | 45534.711 | 22.68 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000082 | 0.298 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0025 | | |
| CHANGE IN WATER STORAGE | -0.620 | -2250.880 | -1.12 |
| SOIL WATER AT START OF YEAR | 14.318 | 51973.137 | |
| SOIL WATER AT END OF YEAR | 13.698 | 49722.258 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | 0.028 | 0.00 |

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MONTHLY TOTALS (IN INCHES) FOR YEAR 21

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 2.20 | 2.62 | 4.70 | 1.43 | 3.57 | 5.14 |
| | 8.00 | 8.81 | 3.09 | 4.09 | 2.13 | 2.88 |
| RUNOFF | 0.033 | 0.000 | 0.693 | 0.009 | 0.236 | 0.454 |
| | 1.065 | 1.507 | 0.053 | 0.542 | 0.068 | 0.180 |
| EVAPOTRANSPIRATION | 1.730 | 2.123 | 3.393 | 1.958 | 3.836 | 3.971 |
| | 6.172 | 6.466 | 3.556 | 1.922 | 0.974 | 1.079 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 0.3269 | 0.5571 | 1.9457 | 0.0610 | 0.0000 | 0.0000 |
| | 0.0009 | 0.3455 | 0.1321 | 0.1348 | 1.2022 | 1.1845 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.001 | 0.001 | 0.005 | 0.000 | 0.000 | 0.000 |
| | 0.000 | 0.001 | 0.000 | 0.000 | 0.003 | 0.003 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.001 | 0.001 | 0.006 | 0.000 | 0.000 | 0.000 |
| | 0.000 | 0.001 | 0.001 | 0.000 | 0.003 | 0.005 |

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ANNUAL TOTALS FOR YEAR 21

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 48.66 | 176635.781 | 100.00 |
| RUNOFF | 4.839 | 17567.094 | 9.95 |
| EVAPOTRANSPIRATION | 37.180 | 134964.281 | 76.41 |
| DRAINAGE COLLECTED FROM LAYER 2 | 5.8908 | 21383.525 | 12.11 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000043 | 0.156 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0012 | | |
| CHANGE IN WATER STORAGE | 0.750 | 2720.762 | 1.54 |
| SOIL WATER AT START OF YEAR | 13.698 | 49722.258 | |
| SOIL WATER AT END OF YEAR | 14.447 | 52443.020 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | -0.040 | 0.00 |

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MONTHLY TOTALS (IN INCHES) FOR YEAR 22

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 1.20 | 2.50 | 4.39 | 3.99 | 4.27 | 10.15 |
| | 9.45 | 6.40 | 3.88 | 4.70 | 2.54 | 1.25 |
| RUNOFF | 0.000 | 0.003 | 0.044 | 0.074 | 0.117 | 2.222 |
| | 1.351 | 0.410 | 0.261 | 0.899 | 0.109 | 0.000 |
| EVAPOTRANSPIRATION | 1.830 | 2.263 | 3.648 | 4.860 | 4.722 | 5.518 |
| | 6.487 | 6.172 | 3.302 | 2.001 | 0.983 | 0.966 |

| | | | | | | |
|---|---|---|---|---|---|---|
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 0.8278 | 0.0170 | 0.2902 | 0.5771 | 0.0023 | 0.7728 |
| | 1.1266 | 0.7125 | 0.0001 | 0.5127 | 1.9210 | 0.4410 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.002 | 0.000 | 0.001 | 0.001 | 0.000 | 0.002 |
| | 0.003 | 0.002 | 0.000 | 0.001 | 0.005 | 0.001 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.002 | 0.000 | 0.002 | 0.001 | 0.000 | 0.004 |
| | 0.003 | 0.002 | 0.000 | 0.002 | 0.003 | 0.001 |

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ANNUAL TOTALS FOR YEAR 22

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 54.72 | 198633.562 | 100.00 |
| RUNOFF | 5.491 | 19933.865 | 10.04 |
| EVAPOTRANSPIRATION | 42.751 | 155185.672 | 78.13 |
| DRAINAGE COLLECTED FROM LAYER 2 | 7.2012 | 26140.348 | 13.16 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000053 | 0.192 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0014 | | |
| CHANGE IN WATER STORAGE | -0.724 | -2626.372 | -1.32 |
| SOIL WATER AT START OF YEAR | 14.447 | 52443.020 | |
| SOIL WATER AT END OF YEAR | 13.724 | 49816.648 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |

ANNUAL TOTALS FOR YEAR 23

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 60.60 | 219977.984 | 100.00 |
| RUNOFF | 8.141 | 29553.408 | 13.43 |
| EVAPOTRANSPIRATION | 37.496 | 136108.797 | 61.87 |
| DRAINAGE COLLECTED FROM LAYER 2 | 14.5504 | 52817.809 | 24.01 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000096 | 0.349 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0029 | | |
| CHANGE IN WATER STORAGE | 0.413 | 1497.709 | 0.68 |
| SOIL WATER AT START OF YEAR | 13.724 | 49816.648 | |
| SOIL WATER AT END OF YEAR | 14.136 | 51314.355 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | -0.093 | 0.00 |

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MONTHLY TOTALS (IN INCHES) FOR YEAR 24

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 2.21 | 5.20 | 6.33 | 3.12 | 6.31 | 10.16 |
| | 10.31 | 11.52 | 0.91 | 5.47 | 3.26 | 3.11 |
| RUNOFF | 0.003 | 0.349 | 0.388 | 0.266 | 0.669 | 3.335 |
| | 0.586 | 1.781 | 0.000 | 0.934 | 0.104 | 0.784 |
| EVAPOTRANSPIRATION | 1.798 | 2.292 | 3.708 | 2.981 | 5.990 | 6.745 |
| | 6.392 | 6.297 | 2.856 | 1.430 | 1.041 | 0.980 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 1.2579 | 0.9366 | 4.2452 | 0.2252 | 0.0353 | 0.8013 |
| | 0.0040 | 4.7627 | 0.0546 | 0.0000 | 2.4451 | 2.0328 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.003 | 0.002 | 0.010 | 0.001 | 0.000 | 0.002 |
| | 0.000 | 0.011 | 0.000 | 0.000 | 0.006 | 0.005 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.002 | 0.003 | 0.007 | 0.001 | 0.000 | 0.003 |
| | 0.000 | 0.010 | 0.000 | 0.000 | 0.005 | 0.005 |

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ANNUAL TOTALS FOR YEAR 24

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 67.91 | 246513.281 | 100.00 |
| RUNOFF | 9.200 | 33396.523 | 13.55 |
| EVAPOTRANSPIRATION | 42.510 | 154312.312 | 62.60 |
| DRAINAGE COLLECTED FROM LAYER 2 | 16.8007 | 60986.691 | 24.74 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000111 | 0.402 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0033 | | |
| CHANGE IN WATER STORAGE | -0.601 | -2182.640 | -0.89 |
| SOIL WATER AT START OF YEAR | 14.136 | 51314.355 | |
| SOIL WATER AT END OF YEAR | 13.535 | 49131.719 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | -0.142 | 0.00 |

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MONTHLY TOTALS (IN INCHES) FOR YEAR 23

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 2.29 | 4.39 | 7.22 | 6.15 | 3.89 | 5.08 |
| | 5.86 | 1.40 | 11.59 | 9.66 | 1.24 | 1.83 |
| RUNOFF | 0.038 | 0.594 | 0.353 | 0.532 | 0.923 | 0.712 |
| | 0.368 | 0.004 | 1.470 | 3.132 | 0.000 | 0.015 |
| EVAPOTRANSPIRATION | 1.751 | 2.455 | 3.916 | 4.545 | 4.435 | 4.118 |
| | 5.719 | 1.397 | 4.466 | 2.419 | 1.024 | 1.251 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 0.3145 | 1.5538 | 2.1449 | 1.5722 | 1.3670 | 0.0000 |
| | 0.0125 | 0.0106 | 2.5072 | 4.1387 | 0.7152 | 0.2137 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.001 | 0.004 | 0.005 | 0.004 | 0.003 | 0.000 |
| | 0.000 | 0.000 | 0.006 | 0.010 | 0.002 | 0.000 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.001 | 0.006 | 0.005 | 0.004 | 0.006 | 0.000 |
| | 0.000 | 0.000 | 0.009 | 0.016 | 0.002 | 0.001 |

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| | | | |
|---|---|---|---|
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | -0.007 | 0.00 |

MONTHLY TOTALS (IN INCHES) FOR YEAR 25

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 2.39 | 2.88 | 3.92 | 2.01 | 2.67 | 5.37 |
| | 3.09 | 8.86 | 7.74 | 4.40 | 1.64 | 1.34 |
| RUNOFF | 0.002 | 0.003 | 0.278 | 0.058 | 0.178 | 0.605 |
| | 0.200 | 1.745 | 0.350 | 0.387 | 0.000 | 0.005 |
| EVAPOTRANSPIRATION | 1.824 | 2.192 | 3.590 | 2.988 | 3.361 | 4.415 |
| | 2.805 | 6.234 | 3.802 | 2.101 | 1.093 | 1.058 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 0.3373 | 0.1834 | 0.9868 | 0.2481 | 0.0076 | 0.0012 |
| | 0.0003 | 0.7710 | 0.0854 | 3.1642 | 0.4269 | 0.9282 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.001 | 0.000 | 0.002 | 0.001 | 0.000 | 0.000 |
| | 0.000 | 0.002 | 0.000 | 0.007 | 0.001 | 0.002 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.001 | 0.001 | 0.002 | 0.001 | 0.000 | 0.000 |
| | 0.000 | 0.002 | 0.001 | 0.008 | 0.001 | 0.001 |

ANNUAL TOTALS FOR YEAR 25

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 46.31 | 168105.359 | 100.00 |
| RUNOFF | 3.810 | 13831.673 | 8.23 |
| EVAPOTRANSPIRATION | 35.465 | 128737.094 | 76.58 |
| DRAINAGE COLLECTED FROM LAYER 2 | 7.1404 | 25919.578 | 15.42 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000052 | 0.188 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0014 | | |
| CHANGE IN WATER STORAGE | -0.106 | -383.264 | -0.23 |
| SOIL WATER AT START OF YEAR | 13.535 | 49131.719 | |
| SOIL WATER AT END OF YEAR | 13.429 | 48748.453 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | 0.094 | 0.00 |

MONTHLY TOTALS (IN INCHES) FOR YEAR 26

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 2.16 | 3.69 | 1.22 | 4.50 | 1.39 | 6.87 |
| | 11.00 | 6.10 | 2.29 | 5.10 | 1.94 | 5.84 |
| RUNOFF | 0.001 | 0.156 | 0.000 | 0.126 | 0.013 | 0.460 |
| | 2.551 | 0.453 | 0.003 | 0.244 | 0.092 | 1.012 |
| EVAPOTRANSPIRATION | 1.644 | 2.438 | 1.867 | 4.374 | 2.374 | 4.165 |
| | 6.353 | 5.335 | 4.404 | 1.946 | 0.944 | 1.228 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 0.1463 | 1.6641 | 0.2013 | 0.1857 | 0.0312 | 0.0000 |
| | 0.8918 | 0.7580 | 0.2795 | 0.0092 | 2.1603 | 2.5748 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.004 | 0.000 | 0.000 | 0.000 | 0.000 |
| | 0.002 | 0.002 | 0.001 | 0.000 | 0.005 | 0.006 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.004 | 0.001 | 0.001 | 0.000 | 0.000 |
| | 0.003 | 0.002 | 0.001 | 0.000 | 0.004 | 0.006 |

ANNUAL TOTALS FOR YEAR 26

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 52.10 | 189123.016 | 100.00 |
| RUNOFF | 5.111 | 18551.859 | 9.81 |
| EVAPOTRANSPIRATION | 37.073 | 134574.719 | 71.16 |
| DRAINAGE COLLECTED FROM LAYER 2 | 8.9022 | 32315.131 | 17.09 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000062 | 0.226 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0018 | | |
| CHANGE IN WATER STORAGE | 1.014 | 3681.024 | 1.95 |
| SOIL WATER AT START OF YEAR | 13.429 | 48748.453 | |
| SOIL WATER AT END OF YEAR | 14.443 | 52429.477 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | 0.063 | 0.00 |

MONTHLY TOTALS (IN INCHES) FOR YEAR 27

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 2.09 | 4.34 | 4.40 | 4.31 | 9.97 | 2.94 |
| | 14.07 | 4.51 | 1.84 | 0.56 | 4.26 | 3.23 |
| RUNOFF | 0.000 | 0.061 | 0.060 | 0.588 | 2.500 | 0.048 |
| | 3.874 | 0.363 | 0.000 | 0.000 | 0.724 | 0.246 |
| EVAPOTRANSPIRATION | 2.086 | 1.962 | 3.555 | 3.562 | 6.258 | 5.098 |
| | 4.371 | 6.350 | 0.962 | 1.386 | 0.876 | 1.360 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 1.1018 | 2.0914 | 0.9514 | 1.2819 | 0.0028 | 0.1188 |
| | 1.6865 | 1.9276 | 0.0002 | 0.0000 | 0.6011 | 0.7919 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.003 | 0.005 | 0.002 | 0.003 | 0.000 | 0.000 |
| | 0.004 | 0.004 | 0.000 | 0.000 | 0.001 | 0.002 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.002 | 0.006 | 0.001 | 0.005 | 0.000 | 0.000 |
| | 0.008 | 0.007 | 0.000 | 0.000 | 0.002 | 0.005 |

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ANNUAL TOTALS FOR YEAR 27

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 56.52 | 205167.578 | 100.00 |
| RUNOFF | 8.463 | 30720.480 | 14.97 |
| EVAPOTRANSPIRATION | 37.825 | 137303.328 | 66.92 |
| DRAINAGE COLLECTED FROM LAYER 2 | 10.5555 | 38316.469 | 18.68 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000072 | 0.261 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0021 | | |
| CHANGE IN WATER STORAGE | -0.323 | -1172.923 | -0.57 |
| SOIL WATER AT START OF YEAR | 14.443 | 52429.477 | |
| SOIL WATER AT END OF YEAR | 14.120 | 51256.555 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | -0.039 | 0.00 |

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MONTHLY TOTALS (IN INCHES) FOR YEAR 28

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 1.65 | 1.96 | 5.02 | 2.97 | 4.84 | 2.17 |
| | 4.04 | 5.73 | 1.17 | 2.79 | 2.87 | 3.13 |
| RUNOFF | 0.014 | 0.009 | 0.014 | 0.008 | 0.267 | 0.003 |
| | 0.109 | 0.682 | 0.000 | 0.219 | 0.108 | 0.027 |
| EVAPOTRANSPIRATION | 1.862 | 2.460 | 3.185 | 4.247 | 5.205 | 2.315 |
| | 4.064 | 2.358 | 3.877 | 0.798 | 1.252 | 1.256 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 0.7229 | 0.1454 | 0.5481 | 0.3054 | 0.0003 | 0.0019 |
| | 0.0036 | 0.0002 | 0.0145 | 0.0000 | 0.8149 | 0.8255 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.002 | 0.000 | 0.001 | 0.001 | 0.000 | 0.000 |
| | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 | 0.002 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.001 | 0.001 | 0.002 | 0.001 | 0.000 | 0.000 |
| | 0.000 | 0.000 | 0.000 | 0.000 | 0.003 | 0.001 |

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ANNUAL TOTALS FOR YEAR 28

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 38.34 | 139174.234 | 100.00 |
| RUNOFF | 1.460 | 5298.951 | 3.81 |
| EVAPOTRANSPIRATION | 32.959 | 119641.484 | 85.97 |
| DRAINAGE COLLECTED FROM LAYER 2 | 3.3828 | 12279.462 | 8.82 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000026 | 0.096 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0007 | | |
| CHANGE IN WATER STORAGE | 0.538 | 1954.204 | 1.40 |
| SOIL WATER AT START OF YEAR | 14.120 | 51256.555 | |
| SOIL WATER AT END OF YEAR | 14.659 | 53210.758 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | 0.029 | 0.00 |

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MONTHLY TOTALS (IN INCHES) FOR YEAR 29

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 1.55 | 3.85 | 7.62 | 1.02 | 5.84 | 3.83 |
| | 6.46 | 5.93 | 5.95 | 0.03 | 1.22 | 1.18 |
| RUNOFF | 0.000 | 0.295 | 1.165 | 0.000 | 0.709 | 0.037 |
| | 1.105 | 0.706 | 0.951 | 0.000 | 0.000 | 0.000 |
| EVAPOTRANSPIRATION | 1.796 | 2.296 | 3.969 | 1.624 | 4.260 | 5.610 |
| | 5.265 | 3.379 | 3.655 | 1.551 | 0.736 | 1.132 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 0.9833 | 0.5512 | 3.6215 | 0.1885 | 0.0070 | 0.0040 |
| | 0.0007 | 0.0019 | 0.0021 | 0.5771 | 0.0007 | 0.0008 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.002 | 0.001 | 0.008 | 0.000 | 0.000 | 0.000 |
| | 0.000 | 0.000 | 0.000 | 0.001 | 0.000 | 0.000 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.003 | 0.001 | 0.007 | 0.001 | 0.000 | 0.000 |
| | 0.000 | 0.000 | 0.000 | 0.001 | 0.000 | 0.000 |

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ANNUAL TOTALS FOR YEAR 29

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 44.48 | 161462.375 | 100.00 |
| RUNOFF | 5.129 | 18616.910 | 11.53 |
| EVAPOTRANSPIRATION | 35.273 | 128039.906 | 79.30 |
| DRAINAGE COLLECTED FROM LAYER 2 | 5.9389 | 21558.125 | 13.35 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000041 | 0.150 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0012 | | |
| CHANGE IN WATER STORAGE | -1.860 | -6752.654 | -4.18 |
| SOIL WATER AT START OF YEAR | 14.659 | 53210.758 | |
| SOIL WATER AT END OF YEAR | 12.798 | 46458.105 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | -0.067 | 0.00 |

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MONTHLY TOTALS (IN INCHES) FOR YEAR 30

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 2.85 | 4.68 | 8.38 | 3.62 | 2.65 | 5.61 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 3.59 | 4.40 | 5.75 | 0.81 | 2.26 | 3.48 |
| RUNOFF | 0.053 | 0.275 | 1.426 | 0.100 | 0.065 | 0.444 |
| | 0.101 | 0.018 | 0.090 | 0.000 | 0.088 | 0.131 |
| EVAPOTRANSPIRATION | 1.844 | 2.230 | 4.003 | 4.137 | 3.735 | 4.021 |
| | 3.667 | 4.606 | 4.072 | 2.010 | 0.876 | 1.301 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 0.8117 | 1.9273 | 2.8336 | 0.3394 | 0.0009 | 0.0001 |
| | 0.0001 | 0.0016 | 0.0007 | 0.0631 | 0.0030 | 0.5238 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.002 | 0.005 | 0.007 | 0.001 | 0.000 | 0.000 |
| | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.003 | 0.006 | 0.007 | 0.001 | 0.000 | 0.000 |
| | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.004 |

ANNUAL TOTALS FOR YEAR 30

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 48.08 | 174530.375 | 100.00 |
| RUNOFF | 2.793 | 10136.993 | 5.81 |
| EVAPOTRANSPIRATION | 36.502 | 132500.906 | 75.92 |
| DRAINAGE COLLECTED FROM LAYER 2 | 6.5054 | 23614.518 | 13.53 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000044 | 0.161 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0013 | | |
| CHANGE IN WATER STORAGE | 2.280 | 8277.850 | 4.74 |
| SOIL WATER AT START OF YEAR | 12.798 | 46458.105 | |
| SOIL WATER AT END OF YEAR | 15.079 | 54735.953 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | -0.055 | 0.00 |

AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 30

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | | | | | | |
| TOTALS | 2.45 | 3.63 | 4.70 | 2.73 | 4.18 | 5.96 |
| | 7.24 | 7.26 | 4.83 | 2.68 | 2.00 | 2.89 |
| STD. DEVIATIONS | 1.74 | 1.59 | 2.10 | 1.69 | 2.34 | 3.23 |
| | 3.35 | 3.06 | 2.66 | 2.46 | 1.05 | 1.52 |
| RUNOFF | | | | | | |
| TOTALS | 0.123 | 0.218 | 0.409 | 0.119 | 0.440 | 0.771 |
| | 0.864 | 0.924 | 0.519 | 0.353 | 0.085 | 0.195 |
| STD. DEVIATIONS | 0.284 | 0.295 | 0.482 | 0.206 | 0.707 | 0.957 |
| | 1.063 | 0.745 | 0.696 | 0.653 | 0.160 | 0.274 |
| EVAPOTRANSPIRATION | | | | | | |
| TOTALS | 1.757 | 2.155 | 3.438 | 3.334 | 3.791 | 4.648 |
| | 5.202 | 5.161 | 3.675 | 1.756 | 0.924 | 1.106 |
| STD. DEVIATIONS | 0.203 | 0.213 | 0.398 | 1.040 | 1.393 | 1.476 |
| | 1.454 | 1.284 | 0.982 | 0.468 | 0.205 | 0.146 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | | | | | | |
| TOTALS | 1.1542 | 1.0329 | 1.3108 | 0.3456 | 0.1904 | 0.3402 |
| | 0.5301 | 0.8754 | 0.7025 | 0.6956 | 0.4772 | 0.9620 |
| STD. DEVIATIONS | 1.1227 | 1.0476 | 1.1269 | 0.4264 | 0.5528 | 0.7117 |
| | 0.9221 | 1.3349 | 0.9539 | 1.2217 | 0.8212 | 0.9679 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | | | | | | |
| TOTALS | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| STD. DEVIATIONS | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| DAILY AVERAGE HEAD ON TOP OF LAYER 3 | | | | | | |
| AVERAGES | 0.0027 | 0.0026 | 0.0031 | 0.0008 | 0.0004 | 0.0008 |
| | 0.0012 | 0.0020 | 0.0017 | 0.0016 | 0.0011 | 0.0022 |
| STD. DEVIATIONS | 0.0026 | 0.0027 | 0.0026 | 0.0010 | 0.0013 | 0.0017 |
| | 0.0022 | 0.0031 | 0.0023 | 0.0028 | 0.0020 | 0.0023 |

AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 30

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 50.57 ( 8.664) | 183580.0 | 100.00 |
| RUNOFF | 5.020 ( 2.4805) | 18223.42 | 9.927 |
| EVAPOTRANSPIRATION | 36.946 ( 3.0507) | 134115.66 | 73.056 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 8.61676 ( 4.40091) | 31278.830 | 17.03826 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.00006 ( 0.00003) | 0.213 | 0.00012 |
| AVERAGE HEAD ON TOP OF LAYER 3 | 0.002 ( 0.001) | | |
| CHANGE IN WATER STORAGE | -0.011 ( 0.9322) | -38.14 | -0.021 |

PEAK DAILY VALUES FOR YEARS 1 THROUGH 30

| | (INCHES) | (CU. FT.) |
|---|---|---|
| PRECIPITATION | 5.32 | 19311.602 |
| RUNOFF | 2.758 | 10011.1699 |
| DRAINAGE COLLECTED FROM LAYER 2 | 0.90545 | 3286.79224 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.000005 | 0.01744 |
| AVERAGE HEAD ON TOP OF LAYER 3 | 0.065 | |
| MAXIMUM HEAD ON TOP OF LAYER 3 | 0.126 | |
| LOCATION OF MAXIMUM HEAD IN LAYER 2 (DISTANCE FROM DRAIN) | 0.0 FEET | |
| SNOW WATER | 1.03 | 3735.4602 |
| MAXIMUM VEG. SOIL WATER (VOL/VOL) | 0.3463 | |
| MINIMUM VEG. SOIL WATER (VOL/VOL) | 0.1360 | |

*** Maximum heads are computed using McEnroe's equations. ***

Reference: Maximum Saturated Depth over Landfill Liner
by Bruce M. McEnroe, University of Kansas
ASCE Journal of Environmental Engineering
Vol. 119, No. 2, March 1993, pp. 262-270.

FINAL WATER STORAGE AT END OF YEAR 30

| LAYER | (INCHES) | (VOL/VOL) |
|---|---|---|
| 1 | 7.3740 | 0.3073 |
| 2 | 0.0187 | 0.0937 |
| 3 | 0.0000 | 0.0000 |
| 4 | 7.6860 | 0.4270 |
| SNOW WATER | 0.000 | |

# APPENDIX B

# HELP RESULTS OF OPTION 3

# (PROPOSED CLOSURETURF® FINAL COVER SYSTEM)

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*****************************************************************************
**                                                                         **
**                                                                         **
**            HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE                **
**              HELP MODEL VERSION 3.07  (1 NOVEMBER 1997)                 **
**                 DEVELOPED BY ENVIRONMENTAL LABORATORY                   **
**                   USAE WATERWAYS EXPERIMENT STATION                     **
**           FOR USEPA RISK REDUCTION ENGINEERING LABORATORY               **
**                                                                         **
**                                                                         **
*****************************************************************************
*****************************************************************************



PRECIPITATION DATA FILE:    C:\DATA4-3.D4
TEMPERATURE DATA FILE:      C:\DATA7-3.D7
SOLAR RADIATION DATA FILE:  C:\DATA13-3.D13
EVAPOTRANSPIRATION DATA:    C:\DATA11-3.D11
SOIL AND DESIGN DATA FILE:  C:\DATA10-3.D10
OUTPUT DATA FILE:           C:\OUT-3.OUT


TIME:  16:18     DATE:   5/ 4/2020


*****************************************************************************

     TITLE:  OPTION3

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     NOTE:  INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
            COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.


                                LAYER  1
                                --------

                    TYPE 1 - VERTICAL PERCOLATION LAYER
                        MATERIAL TEXTURE NUMBER   0
          THICKNESS                     =      0.60   INCHES
          POROSITY                      =      0.4270 VOL/VOL
          FIELD CAPACITY                =      0.4180 VOL/VOL
          WILTING POINT                 =      0.3670 VOL/VOL
          INITIAL SOIL WATER CONTENT    =      0.4270 VOL/VOL
          EFFECTIVE SAT. HYD. COND.     =  0.999999975000E-05 CM/SEC


                  GENERAL DESIGN AND EVAPORATIVE ZONE DATA
                  ---------------------------------------

        NOTE:  SCS RUNOFF CURVE NUMBER WAS USER-SPECIFIED.

       SCS RUNOFF CURVE NUMBER             =     93.00
       FRACTION OF AREA ALLOWING RUNOFF    =    100.0    PERCENT
       AREA PROJECTED ON HORIZONTAL PLANE  =      1.000  ACRES
       EVAPORATIVE ZONE DEPTH              =      0.6    INCHES
       INITIAL WATER IN EVAPORATIVE ZONE   =      0.141  INCHES
       UPPER LIMIT OF EVAPORATIVE STORAGE  =      0.262  INCHES
       LOWER LIMIT OF EVAPORATIVE STORAGE  =      0.014  INCHES
       INITIAL SNOW WATER                  =      0.000  INCHES
       INITIAL WATER IN LAYER MATERIALS    =      7.833  INCHES
       TOTAL INITIAL WATER                 =      7.833  INCHES
       TOTAL SUBSURFACE INFLOW             =      0.00   INCHES/YEAR


                  EVAPOTRANSPIRATION AND WEATHER DATA
                  -----------------------------------

        NOTE:  EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
               CHARLESTON            SOUTH CAROLINA

           STATION LATITUDE                      =  32.90 DEGREES
           MAXIMUM LEAF AREA INDEX               =   0.00
           START OF GROWING SEASON (JULIAN DATE) =     59
           END OF GROWING SEASON (JULIAN DATE)   =    336
           EVAPORATIVE ZONE DEPTH                =   0.6  INCHES
           AVERAGE ANNUAL WIND SPEED             =   8.70 MPH
           AVERAGE 1ST QUARTER RELATIVE HUMIDITY =  70.00 %
           AVERAGE 2ND QUARTER RELATIVE HUMIDITY =  74.00 %
           AVERAGE 3RD QUARTER RELATIVE HUMIDITY =  80.00 %
           AVERAGE 4TH QUARTER RELATIVE HUMIDITY =  75.00 %


        NOTE:  PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING
```

```
          POROSITY                      =      0.4370 VOL/VOL
          FIELD CAPACITY                =      0.0620 VOL/VOL
          WILTING POINT                 =      0.0240 VOL/VOL
          INITIAL SOIL WATER CONTENT    =      0.2343 VOL/VOL
          EFFECTIVE SAT. HYD. COND.     =  0.249999994000E-02 CM/SEC


                                LAYER  2
                                --------

                    TYPE 2 - LATERAL DRAINAGE LAYER
                        MATERIAL TEXTURE NUMBER   0
          THICKNESS                     =      0.13   INCHES
          POROSITY                      =      0.8500 VOL/VOL
          FIELD CAPACITY                =      0.0100 VOL/VOL
          WILTING POINT                 =      0.0050 VOL/VOL
          INITIAL SOIL WATER CONTENT    =      0.0481 VOL/VOL
          EFFECTIVE SAT. HYD. COND.     =   31.6000004000     CM/SEC
          SLOPE                         =     33.00   PERCENT
          DRAINAGE LENGTH               =    100.0    FEET


                                LAYER  3
                                --------

                    TYPE 4 - FLEXIBLE MEMBRANE LINER
                        MATERIAL TEXTURE NUMBER  36
          THICKNESS                     =      0.05   INCHES
          POROSITY                      =      0.0000 VOL/VOL
          FIELD CAPACITY                =      0.0000 VOL/VOL
          WILTING POINT                 =      0.0000 VOL/VOL
          INITIAL SOIL WATER CONTENT    =      0.0000 VOL/VOL
          EFFECTIVE SAT. HYD. COND.     =  0.399999993000E-12 CM/SEC
          FML PINHOLE DENSITY           =      2.00   HOLES/ACRE
          FML INSTALLATION DEFECTS      =      2.00   HOLES/ACRE
          FML PLACEMENT QUALITY         =  3 - GOOD


                                LAYER  4
                                --------

                    TYPE 3 - BARRIER SOIL LINER
                        MATERIAL TEXTURE NUMBER   0
          THICKNESS                     =     18.00   INCHES
```

```
                  COEFFICIENTS FOR    CHARLESTON           SOUTH CAROLINA

                NORMAL MEAN MONTHLY PRECIPITATION (INCHES)

     JAN/JUL      FEB/AUG      MAR/SEP      APR/OCT      MAY/NOV      JUN/DEC
     -------      -------      -------      -------      -------      -------
        3.33         3.37         4.38         2.58         4.41         6.54
        7.33         6.50         4.94         2.92         2.18         3.11


        NOTE:  TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
                  COEFFICIENTS FOR    CHARLESTON           SOUTH CAROLINA

             NORMAL MEAN MONTHLY TEMPERATURE (DEGREES FAHRENHEIT)

     JAN/JUL      FEB/AUG      MAR/SEP      APR/OCT      MAY/NOV      JUN/DEC
     -------      -------      -------      -------      -------      -------
       47.90        49.80        56.70        64.30        72.20        77.60
       80.50        80.00        75.70        65.80        56.70        50.00


        NOTE:  SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
                  COEFFICIENTS FOR    CHARLESTON           SOUTH CAROLINA
                    AND STATION LATITUDE  =  32.90 DEGREES


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                  MONTHLY TOTALS (IN INCHES) FOR YEAR    1
-----------------------------------------------------------------------------

                              JAN/JUL FEB/AUG MAR/SEP APR/OCT MAY/NOV JUN/DEC
                              ------- ------- ------- ------- ------- -------

PRECIPITATION                  1.33    1.60    4.13    1.44    2.39   11.62
                               7.75    7.92    6.08    2.65    1.49    7.85

RUNOFF                         0.055   0.025   0.470   0.163   0.144   4.382
                               1.751   2.089   1.662   0.381   0.118   1.327

EVAPOTRANSPIRATION             0.427   0.551   0.925   0.312   0.940   1.782
                               2.153   2.041   0.827   0.598   0.075   1.393

LATERAL DRAINAGE COLLECTED     0.9798  0.9935  2.6474  0.9666  1.4218  5.4562
```

| | | | | | | |
|---|---|---|---|---|---|---|
| FROM LAYER 2 | 3.7130 | 4.0018 | 3.4666 | 1.7969 | 1.1703 | 5.1259 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| STD. DEVIATION OF DAILY HEAD DN TOP OF LAYER 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 |
| | 0.001 | 0.001 | 0.001 | 0.000 | 0.000 | 0.001 |

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ANNUAL TOTALS FOR YEAR 1

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 56.25 | 204187.469 | 100.00 |
| RUNOFF | 12.485 | 45320.668 | 22.20 |
| EVAPOTRANSPIRATION | 12.025 | 43650.883 | 21.38 |
| DRAINAGE COLLECTED FROM LAYER 2 | 31.7399 | 115215.937 | 56.43 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000007 | 0.027 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0002 | | |
| CHANGE IN WATER STORAGE | 0.000 | 0.002 | 0.00 |
| SOIL WATER AT START OF YEAR | 7.833 | 28433.209 | |
| SOIL WATER AT END OF YEAR | 7.833 | 28433.211 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | -0.043 | 0.00 |

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MONTHLY TOTALS (IN INCHES) FOR YEAR 2

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 1.94 | 3.81 | 5.11 | 6.07 | 9.80 | 6.74 |
| | 8.57 | 1.23 | 7.94 | 1.92 | 1.34 | 1.03 |
| RUNOFF | 0.288 | 0.524 | 1.387 | 0.906 | 3.746 | 1.606 |
| | 2.475 | 0.015 | 2.561 | 0.167 | 0.005 | 0.000 |
| EVAPOTRANSPIRATION | 0.278 | 0.937 | 1.490 | 1.732 | 1.555 | 2.050 |
| | 1.789 | 0.329 | 1.400 | 0.284 | 0.390 | 0.259 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 1.4819 | 2.3564 | 2.2494 | 3.3028 | 4.5044 | 3.2079 |
| | 4.3054 | 0.7704 | 4.0943 | 1.4691 | 0.9444 | 0.6534 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.000 | 0.000 | 0.001 | 0.001 | 0.000 |
| | 0.001 | 0.000 | 0.001 | 0.000 | 0.000 | 0.000 |

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ANNUAL TOTALS FOR YEAR 2

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 55.50 | 201465.031 | 100.00 |
| RUNOFF | 13.681 | 49661.082 | 24.65 |
| EVAPOTRANSPIRATION | 12.493 | 45350.148 | 22.51 |
| DRAINAGE COLLECTED FROM LAYER 2 | 29.3399 | 106503.711 | 52.86 |
| PERC./LEAKAGE THRDUGH LAYER 4 | 0.000007 | 0.024 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0002 | | |
| CHANGE IN WATER STORAGE | -0.014 | -49.972 | -0.02 |
| SOIL WATER AT START OF YEAR | 7.833 | 28433.211 | |
| SOIL WATER AT END OF YEAR | 7.819 | 28383.238 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | 0.038 | 0.00 |

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MONTHLY TOTALS (IN INCHES) FOR YEAR 3

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 9.55 | 3.03 | 2.48 | 1.04 | 2.28 | 11.50 |
| | 17.18 | 7.61 | 10.13 | 1.38 | 1.84 | 2.61 |
| RUNOFF | 1.969 | 0.304 | 0.156 | 0.170 | 0.036 | 4.905 |
| | 7.234 | 2.452 | 3.836 | 0.067 | 0.189 | 0.088 |
| EVAPOTRANSPIRATION | 1.638 | 0.776 | 0.860 | 0.100 | 0.609 | 1.680 |
| | 3.314 | 1.567 | 1.862 | 0.562 | 0.232 | 0.706 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 5.9950 | 1.9351 | 1.4642 | 0.7703 | 1.6352 | 4.9148 |
| | 6.5094 | 3.6729 | 4.4290 | 0.7955 | 1.4184 | 1.8150 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 |
| | 0.001 | 0.000 | 0.001 | 0.000 | 0.000 | 0.000 |

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ANNUAL TOTALS FOR YEAR 3

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 70.63 | 256386.891 | 100.00 |
| RUNOFF | 21.486 | 77995.867 | 30.42 |
| EVAPDTRANSPIRATIDN | 13.906 | 50479.203 | 19.69 |
| DRAINAGE COLLECTED FROM LAYER 2 | 35.3548 | 128337.875 | 50.06 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000008 | 0.029 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0002 | | |
| CHANGE IN WATER STORAGE | -0.117 | -426.076 | -0.17 |
| SOIL WATER AT START OF YEAR | 7.819 | 28383.238 | |
| SOIL WATER AT END OF YEAR | 7.702 | 27957.164 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |

| | | | |
|---|---|---|---|
| ANNUAL WATER BUDGET BALANCE | 0.0000 | -0.008 | 0.00 |

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MONTHLY TOTALS (IN INCHES) FOR YEAR 4

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 3.35 | 4.24 | 2.43 | 2.92 | 3.58 | 4.01 |
| | 6.62 | 3.89 | 6.00 | 1.40 | 1.58 | 1.23 |
| RUNOFF | 0.392 | 0.685 | 0.234 | 0.237 | 0.167 | 0.454 |
| | 1.022 | 0.753 | 1.222 | 0.170 | 0.105 | 0.008 |
| EVAPOTRANSPIRATION | 0.891 | 0.705 | 0.668 | 1.333 | 1.231 | 1.172 |
| | 2.332 | 0.805 | 1.321 | 0.333 | 0.240 | 0.421 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 2.0663 | 2.6592 | 1.5315 | 1.4573 | 2.0681 | 2.4988 |
| | 3.2204 | 2.3775 | 3.4201 | 0.9344 | 1.2347 | 0.7992 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 |
| | 0.000 | 0.001 | 0.001 | 0.000 | 0.000 | 0.000 |

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| | | | | | | |
|---|---|---|---|---|---|---|
| EVAPOTRANSPIRATION | 0.280 | 0.576 | 1.912 | 0.636 | 1.636 | 0.130 |
| | 2.778 | 1.988 | 0.834 | 0.405 | 0.518 | 0.856 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 0.9792 | 2.0915 | 5.3053 | 1.4405 | 3.5194 | 0.3601 |
| | 4.7855 | 5.0372 | 2.6831 | 2.2819 | 1.1485 | 1.2747 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.001 | 0.001 | 0.000 | 0.000 | 0.000 |
| | 0.001 | 0.001 | 0.001 | 0.001 | 0.000 | 0.000 |

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ANNUAL TOTALS FOR YEAR 5

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 56.51 | 205131.203 | 100.00 |
| RUNOFF | 13.056 | 47394.383 | 23.10 |
| EVAPOTRANSPIRATION | 12.549 | 45554.012 | 22.21 |
| DRAINAGE COLLECTED FROM LAYER 2 | 30.9069 | 112192.148 | 54.69 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000007 | 0.026 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0002 | | |
| CHANGE IN WATER STORAGE | -0.003 | -9.273 | 0.00 |
| SOIL WATER AT START OF YEAR | 7.704 | 27966.436 | |
| SOIL WATER AT END OF YEAR | 7.702 | 27957.164 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |

ANNUAL TOTALS FOR YEAR 4

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 41.25 | 149737.500 | 100.00 |
| RUNOFF | 5.449 | 19780.475 | 13.21 |
| EVAPOTRANSPIRATION | 11.531 | 41857.055 | 27.95 |
| DRAINAGE COLLECTED FROM LAYER 2 | 24.2674 | 88090.703 | 58.83 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000006 | 0.022 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0002 | | |
| CHANGE IN WATER STORAGE | 0.003 | 9.273 | 0.01 |
| SOIL WATER AT START OF YEAR | 7.702 | 27957.164 | |
| SOIL WATER AT END OF YEAR | 7.704 | 27966.436 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | -0.028 | 0.00 |

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MONTHLY TOTALS (IN INCHES) FOR YEAR 5

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 1.26 | 3.46 | 9.26 | 2.23 | 8.35 | 0.49 |
| | 9.84 | 9.38 | 3.97 | 4.42 | 1.76 | 2.09 |
| RUNOFF | 0.003 | 0.691 | 2.012 | 0.161 | 3.319 | 0.000 |
| | 2.276 | 2.224 | 0.581 | 1.736 | 0.036 | 0.017 |

| | | | |
|---|---|---|---|
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | -0.090 | 0.00 |

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MONTHLY TOTALS (IN INCHES) FOR YEAR 6

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 2.46 | 2.46 | 2.01 | 4.27 | 3.35 | 11.39 |
| | 5.46 | 7.83 | 2.46 | 5.63 | 0.79 | 4.84 |
| RUNOFF | 0.075 | 0.144 | 0.165 | 0.561 | 0.475 | 3.818 |
| | 0.438 | 1.254 | 0.219 | 1.665 | 0.015 | 0.989 |
| EVAPOTRANSPIRATION | 0.882 | 0.753 | 0.518 | 1.077 | 0.539 | 2.668 |
| | 2.554 | 2.748 | 0.600 | 0.881 | 0.178 | 0.659 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 1.5029 | 1.5530 | 1.3308 | 2.6381 | 2.3358 | 4.9039 |
| | 2.4006 | 3.8308 | 1.7066 | 3.0848 | 0.5970 | 3.1925 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.001 |
| | 0.000 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 |

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ANNUAL TOTALS FOR YEAR 6

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 52.95 | 192208.547 | 100.00 |
| RUNOFF | 9.818 | 35639.176 | 18.54 |
| EVAPOTRANSPIRATION | 14.056 | 51022.863 | 26.55 |
| DRAINAGE COLLECTED FROM LAYER 2 | 29.0761 | 105546.398 | 54.91 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000007 | 0.025 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0002 | | |
| CHANGE IN WATER STORAGE | 0.000 | 0.000 | 0.00 |
| SOIL WATER AT START OF YEAR | 7.702 | 27957.164 | |
| SOIL WATER AT END OF YEAR | 7.702 | 27957.164 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | 0.079 | 0.00 |

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MONTHLY TOTALS (IN INCHES) FOR YEAR 7

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 1.05 | 2.32 | 6.14 | 2.84 | 2.24 | 1.23 |
| | 3.66 | 7.88 | 5.64 | 2.29 | 3.25 | 3.14 |
| RUNOFF | 0.000 | 0.402 | 1.956 | 0.253 | 0.000 | 0.004 |
| | 0.368 | 2.255 | 1.110 | 0.449 | 0.230 | 0.421 |
| EVAPOTRANSPIRATION | 0.391 | 0.475 | 0.961 | 0.815 | 0.805 | 0.261 |
| | 0.793 | 2.385 | 0.897 | 0.332 | 0.645 | 0.428 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 0.6586 | 1.4412 | 3.1113 | 1.8861 | 1.3552 | 0.9563 |
| | 2.5074 | 3.2401 | 3.6329 | 1.5090 | 2.3567 | 2.1769 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.000 | 0.001 | 0.000 | 0.000 | 0.000 |
| | 0.000 | 0.001 | 0.001 | 0.000 | 0.000 | 0.001 |

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ANNUAL TOTALS FOR YEAR 7

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 41.68 | 151298.375 | 100.00 |
| RUNOFF | 7.528 | 27327.260 | 18.06 |
| EVAPOTRANSPIRATION | 9.189 | 33355.980 | 22.05 |
| DRAINAGE COLLECTED FROM LAYER 2 | 24.8317 | 90139.250 | 59.58 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000006 | 0.021 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0002 | | |
| CHANGE IN WATER STORAGE | 0.131 | 475.862 | 0.31 |
| SOIL WATER AT START OF YEAR | 7.702 | 27957.164 | |
| SOIL WATER AT END OF YEAR | 7.833 | 28433.025 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | 0.001 | 0.00 |

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MONTHLY TOTALS (IN INCHES) FOR YEAR 8

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 1.62 | 2.94 | 3.39 | 5.95 | 3.46 | 3.91 |
| | 4.25 | 5.99 | 5.46 | 2.54 | 1.26 | 3.58 |
| RUNOFF | 0.844 | 0.733 | 0.497 | 1.686 | 0.224 | 0.580 |
| | 0.341 | 1.043 | 2.429 | 0.956 | 0.008 | 0.352 |
| EVAPOTRANSPIRATION | 0.139 | 0.410 | 0.506 | 1.277 | 0.958 | 0.885 |
| | 1.470 | 1.236 | 0.618 | 0.276 | 0.388 | 0.641 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 0.7677 | 1.7973 | 2.2619 | 3.1124 | 2.2781 | 2.3320 |
| | 2.5530 | 3.6086 | 2.4284 | 1.3430 | 0.9142 | 2.5883 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.001 | 0.001 | 0.001 | 0.000 | 0.001 |
| | 0.000 | 0.001 | 0.000 | 0.001 | 0.000 | 0.000 |

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ANNUAL TOTALS FOR YEAR 8

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 44.35 | 160990.531 | 100.00 |
| RUNOFF | 9.692 | 35181.445 | 21.85 |
| EVAPOTRANSPIRATION | 8.804 | 31959.223 | 19.85 |
| DRAINAGE COLLECTED FROM LAYER 2 | 25.9850 | 94325.664 | 58.59 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000006 | 0.022 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0002 | | |
| CHANGE IN WATER STORAGE | -0.131 | -475.862 | -0.30 |
| SOIL WATER AT START OF YEAR | 7.833 | 28433.025 | |
| SOIL WATER AT END OF YEAR | 7.702 | 27957.164 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | 0.045 | 0.00 |

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MONTHLY TOTALS (IN INCHES) FOR YEAR 9

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 4.90 | 2.07 | 5.76 | 3.18 | 3.96 | 3.45 |
| | 7.17 | 11.97 | 3.97 | 1.01 | 3.96 | 2.50 |

| | | | | | | |
|---|---|---|---|---|---|---|
| RUNOFF | 0.374 | 0.150 | 0.843 | 0.145 | 0.554 | 0.576 |
| | 1.851 | 4.461 | 0.854 | 0.000 | 0.557 | 0.492 |
| EVAPOTRANSPIRATION | 1.329 | 0.417 | 1.602 | 1.183 | 0.808 | 0.697 |
| | 1.758 | 1.947 | 0.774 | 0.116 | 0.678 | 0.485 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 3.1969 | 1.4867 | 3.3316 | 1.8519 | 2.5974 | 2.1756 |
| | 3.5624 | 5.5621 | 2.3429 | 0.7823 | 2.7101 | 1.6502 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 |
| | 0.001 | 0.001 | 0.000 | 0.000 | 0.001 | 0.000 |

ANNUAL TOTALS FOR YEAR 9

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 53.90 | 195656.953 | 100.00 |
| RUNOFF | 10.857 | 39412.199 | 20.14 |
| EVAPOTRANSPIRATION | 11.793 | 42807.566 | 21.88 |
| DRAINAGE COLLECTED FROM LAYER 2 | 31.2499 | 113437.211 | 57.98 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000007 | 0.026 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0002 | | |
| CHANGE IN WATER STORAGE | 0.000 | 0.000 | 0.00 |
| SOIL WATER AT START OF YEAR | 7.702 | 27957.164 | |
| SOIL WATER AT END OF YEAR | 7.702 | 27957.164 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | -0.051 | 0.00 |

ANNUAL TOTALS FOR YEAR 10

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 49.82 | 180846.641 | 100.00 |
| RUNOFF | 10.445 | 37916.141 | 20.97 |
| EVAPOTRANSPIRATION | 11.408 | 41411.465 | 22.90 |
| DRAINAGE COLLECTED FROM LAYER 2 | 27.9663 | 101517.531 | 56.13 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000006 | 0.023 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0002 | | |
| CHANGE IN WATER STORAGE | 0.000 | 1.437 | 0.00 |
| SOIL WATER AT START OF YEAR | 7.702 | 27957.164 | |
| SOIL WATER AT END OF YEAR | 7.702 | 27958.600 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | 0.039 | 0.00 |

MONTHLY TOTALS (IN INCHES) FOR YEAR 11

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 2.47 | 1.15 | 6.47 | 0.52 | 4.72 | 6.44 |
| | 7.41 | 11.47 | 5.30 | 0.47 | 1.24 | 2.16 |
| RUNOFF | 0.106 | 0.000 | 1.819 | 0.000 | 0.567 | 1.062 |
| | 1.997 | 4.059 | 0.770 | 0.004 | 0.005 | 0.056 |
| EVAPOTRANSPIRATION | 0.743 | 0.542 | 0.931 | 0.170 | 1.084 | 1.697 |
| | 1.850 | 1.879 | 1.570 | 0.073 | 0.361 | 0.510 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 1.6207 | 0.6079 | 3.7200 | 0.3505 | 3.0662 | 3.5686 |
| | 3.6760 | 5.4215 | 3.0730 | 0.3934 | 0.8142 | 1.6535 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 |
| | 0.001 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 |

MONTHLY TOTALS (IN INCHES) FOR YEAR 10

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 5.32 | 2.54 | 3.82 | 0.91 | 5.01 | 7.46 |
| | 9.21 | 2.68 | 1.58 | 0.94 | 1.21 | 2.77 |
| RUNOFF | 1.784 | 0.046 | 0.649 | 0.001 | 0.629 | 1.500 |
| | 2.487 | 0.201 | 0.000 | 0.050 | 0.153 | 0.223 |
| EVAPOTRANSPIRATION | 0.661 | 0.956 | 0.907 | 0.450 | 1.027 | 2.004 |
| | 2.242 | 0.648 | 0.682 | 0.233 | 0.137 | 0.530 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 2.8760 | 1.5302 | 2.2716 | 0.4390 | 3.2502 | 4.0711 |
| | 4.3913 | 1.8401 | 0.8976 | 0.6567 | 0.9202 | 1.9891 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.001 | 0.000 | 0.000 | 0.000 | 0.001 | 0.000 |
| | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

ANNUAL TOTALS FOR YEAR 11

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 43.45 | 157723.516 | 100.00 |
| RUNOFF | 7.804 | 28328.256 | 17.96 |
| EVAPOTRANSPIRATION | 10.477 | 38031.859 | 24.11 |
| DRAINAGE COLLECTED FROM LAYER 2 | 25.1420 | 91265.422 | 57.86 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000006 | 0.022 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0002 | | |
| CHANGE IN WATER STORAGE | 0.027 | 97.923 | 0.06 |

| | | | |
|---|---|---|---|
| SOIL WATER AT START OF YEAR | 7.702 | 27958.600 | |
| SOIL WATER AT END OF YEAR | 7.729 | 28056.523 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | 0.035 | 0.00 |

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MONTHLY TOTALS (IN INCHES) FOR YEAR 12

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 0.93 | 2.85 | 4.08 | 1.31 | 3.74 | 5.97 |
| | 4.46 | 7.69 | 3.09 | 2.13 | 2.12 | 1.53 |
| RUNOFF | 0.000 | 0.382 | 0.783 | 0.010 | 0.767 | 1.537 |
| | 0.213 | 2.051 | 0.419 | 0.318 | 0.438 | 0.008 |
| EVAPOTRANSPIRATION | 0.349 | 0.680 | 1.034 | 0.367 | 0.777 | 1.173 |
| | 2.042 | 1.332 | 0.724 | 0.322 | 0.284 | 0.381 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 0.5013 | 1.8951 | 2.2624 | 0.8825 | 2.2481 | 3.2599 |
| | 2.2023 | 4.2794 | 1.9773 | 1.4901 | 1.3973 | 1.1410 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.001 |
| | 0.000 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 |

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ANNUAL TOTALS FOR YEAR 12

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 39.90 | 144837.000 | 100.00 |
| RUNOFF | 6.927 | 25143.768 | 17.36 |
| EVAPOTRANSPIRATION | 9.464 | 34354.437 | 23.72 |
| DRAINAGE COLLECTED FROM LAYER 2 | 23.5367 | 85438.125 | 58.99 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000006 | 0.020 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0002 | | |
| CHANGE IN WATER STORAGE | -0.027 | -99.360 | -0.07 |
| SOIL WATER AT START OF YEAR | 7.729 | 28056.523 | |
| SOIL WATER AT END OF YEAR | 7.702 | 27957.164 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | 0.013 | 0.00 |

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MONTHLY TOTALS (IN INCHES) FOR YEAR 13

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 1.51 | 5.66 | 3.69 | 2.73 | 0.59 | 6.40 |
| | 1.64 | 7.64 | 2.34 | 0.21 | 0.45 | 4.13 |
| RUNOFF | 0.048 | 0.909 | 0.530 | 0.391 | 0.006 | 2.756 |
| | 0.061 | 1.713 | 0.023 | 0.000 | 0.000 | 0.778 |
| EVAPOTRANSPIRATION | 0.406 | 1.010 | 0.886 | 0.614 | 0.123 | 1.051 |
| | 0.297 | 1.641 | 0.655 | 0.020 | 0.122 | 0.621 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 0.9890 | 3.8003 | 2.2741 | 1.7249 | 0.4609 | 2.5930 |
| | 1.2813 | 4.2060 | 1.6615 | 0.0827 | 0.4099 | 2.6363 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 |
| | 0.000 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 |

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ANNUAL TOTALS FOR YEAR 13

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 36.99 | 134273.687 | 100.00 |
| RUNOFF | 7.216 | 26192.674 | 19.51 |
| EVAPDTRANSPIRATIDN | 7.454 | 27057.346 | 20.15 |
| DRAINAGE COLLECTED FROM LAYER 2 | 22.2000 | 80586.016 | 60.02 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000005 | 0.019 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0001 | | |
| CHANGE IN WATER STORAGE | 0.121 | 437.620 | 0.33 |
| SOIL WATER AT START OF YEAR | 7.702 | 27957.164 | |
| SOIL WATER AT END OF YEAR | 7.822 | 28394.783 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | 0.017 | 0.00 |

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MONTHLY TOTALS (IN INCHES) FOR YEAR 14

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 0.96 | 1.63 | 6.28 | 1.14 | 6.46 | 3.16 |
| | 4.62 | 5.52 | 5.16 | 0.76 | 0.66 | 3.41 |
| RUNOFF | 0.000 | 0.100 | 1.379 | 0.104 | 1.047 | 0.675 |
| | 0.694 | 1.298 | 0.447 | 0.000 | 0.000 | 0.887 |
| EVAPOTRANSPIRATION | 0.365 | 0.399 | 1.563 | 0.209 | 1.375 | 0.824 |
| | 1.933 | 0.976 | 1.986 | 0.264 | 0.205 | 0.360 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 0.7158 | 1.1307 | 3.3052 | 0.8230 | 4.0754 | 1.6614 |
| | 1.9926 | 3.1191 | 2.8547 | 0.4965 | 0.4554 | 2.1628 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| | | | | | | |
|---|---|---|---|---|---|---|
| TOP OF LAYER 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.000 | 0.001 | 0.000 | 0.001 | 0.000 |
| | 0.000 | 0.001 | 0.000 | 0.000 | 0.000 | 0.001 |

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ANNUAL TOTALS FOR YEAR 14

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 39.76 | 144328.797 | 100.00 |
| RUNOFF | 6.629 | 24065.006 | 16.67 |
| EVAPOTRANSPIRATION | 10.458 | 37964.344 | 26.30 |
| DRAINAGE COLLECTED FROM LAYER 2 | 22.7926 | 82737.047 | 57.33 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000006 | 0.020 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0001 | | |
| CHANGE IN WATER STORAGE | -0.121 | -437.620 | -0.30 |
| SOIL WATER AT START OF YEAR | 7.822 | 28394.783 | |
| SOIL WATER AT END OF YEAR | 7.702 | 27957.164 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | -0.008 | 0.00 |

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MONTHLY TOTALS (IN INCHES) FOR YEAR 15

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 0.66 | 4.46 | 1.62 | 0.16 | 5.79 | 2.55 |
| | 5.96 | 7.78 | 7.59 | 1.32 | 1.54 | 4.27 |
| RUNOFF | 0.001 | 0.267 | 0.005 | 0.000 | 2.588 | 0.272 |
| | 1.230 | 2.569 | 2.628 | 0.080 | 0.294 | 1.195 |
| EVAPOTRANSPIRATION | 0.165 | 1.309 | 0.880 | 0.032 | 0.910 | 0.673 |
| | 1.189 | 1.520 | 1.046 | 0.207 | 0.408 | 0.506 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 0.4939 | 2.7804 | 0.8393 | 0.1282 | 2.2916 | 1.6055 |
| | 3.4263 | 3.8058 | 3.8102 | 1.1021 | 0.8749 | 2.5695 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.000 |
| | 0.001 | 0.001 | 0.001 | 0.000 | 0.000 | 0.001 |

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ANNUAL TOTALS FOR YEAR 15

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 43.70 | 158631.000 | 100.00 |
| RUNOFF | 11.127 | 40391.656 | 25.46 |
| EVAPOTRANSPIRATION | 8.845 | 32108.102 | 20.24 |
| DRAINAGE COLLECTED FROM LAYER 2 | 23.7276 | 86131.234 | 54.30 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000006 | 0.020 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0001 | | |
| CHANGE IN WATER STORAGE | 0.000 | 0.000 | 0.00 |
| SOIL WATER AT START OF YEAR | 7.702 | 27957.164 | |
| SOIL WATER AT END OF YEAR | 7.702 | 27957.164 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | -0.013 | 0.00 |

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MONTHLY TOTALS (IN INCHES) FOR YEAR 16

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 1.75 | 3.05 | 3.09 | 1.70 | 2.01 | 7.29 |
| | 10.04 | 7.93 | 3.34 | 0.77 | 0.86 | 1.77 |
| RUNOFF | 0.076 | 0.269 | 0.552 | 0.356 | 0.202 | 1.650 |
| | 2.291 | 1.277 | 0.283 | 0.029 | 0.017 | 0.038 |
| EVAPOTRANSPIRATION | 0.585 | 0.808 | 0.704 | 0.200 | 0.292 | 2.406 |
| | 2.935 | 2.369 | 1.078 | 0.229 | 0.212 | 0.480 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 1.0895 | 1.9102 | 1.8971 | 1.1443 | 1.5162 | 3.2333 |
| | 4.7213 | 4.3758 | 1.8937 | 0.5687 | 0.6600 | 1.2518 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

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ANNUAL TOTALS FOR YEAR 16

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 43.60 | 158267.937 | 100.00 |
| RUNOFF | 7.040 | 25555.928 | 16.15 |
| EVAPOTRANSPIRATION | 12.298 | 44641.840 | 28.21 |
| DRAINAGE COLLECTED FROM LAYER 2 | 24.2618 | 88070.227 | 55.65 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000006 | 0.021 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0001 | | |
| CHANGE IN WATER STORAGE | 0.000 | 0.000 | 0.00 |
| SOIL WATER AT START OF YEAR | 7.702 | 27957.164 | |
| SOIL WATER AT END OF YEAR | 7.702 | 27957.164 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | -0.077 | 0.00 |

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MONTHLY TOTALS (IN INCHES) FOR YEAR 17

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 2.70 | 7.01 | 3.69 | 4.53 | 3.61 | 4.66 |
| | 7.94 | 15.04 | 6.69 | 2.52 | 1.73 | 1.89 |
| RUNOFF | 0.189 | 1.815 | 0.336 | 0.834 | 0.996 | 0.522 |
| | 2.029 | 4.411 | 3.391 | 0.082 | 0.038 | 0.360 |
| EVAPOTRANSPIRATION | 0.639 | 1.295 | 0.744 | 0.763 | 0.451 | 1.556 |
| | 1.931 | 3.213 | 0.987 | 0.699 | 0.314 | 0.476 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 1.8714 | 3.9010 | 2.4843 | 2.9320 | 2.1563 | 2.7150 |
| | 3.9803 | 7.3644 | 2.3637 | 1.7388 | 1.3783 | 1.0536 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | 0.000 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.001 | 0.000 | 0.000 | 0.001 | 0.001 |
| | 0.001 | 0.001 | 0.001 | 0.000 | 0.000 | 0.000 |

ANNUAL TOTALS FOR YEAR 17

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 62.01 | 225096.312 | 100.00 |
| RUNOFF | 15.003 | 54460.605 | 24.19 |
| EVAPOTRANSPIRATION | 13.068 | 47436.402 | 21.07 |
| DRAINAGE COLLECTED FROM LAYER 2 | 33.9392 | 123199.312 | 54.73 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000008 | 0.028 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0002 | | |
| CHANGE IN WATER STORAGE | 0.000 | 0.000 | 0.00 |
| SOIL WATER AT START OF YEAR | 7.702 | 27957.164 | |
| SOIL WATER AT END OF YEAR | 7.702 | 27957.164 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | -0.042 | 0.00 |

MONTHLY TOTALS (IN INCHES) FOR YEAR 18

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 3.70 | 6.40 | 8.35 | 3.47 | 5.66 | 7.17 |
| | 3.82 | 6.48 | 1.53 | 1.46 | 3.03 | 1.96 |
| RUNOFF | 0.313 | 1.165 | 2.699 | 0.229 | 0.744 | 1.917 |
| | 0.421 | 1.081 | 0.033 | 0.121 | 0.844 | 0.059 |
| EVAPOTRANSPIRATION | 0.764 | 1.216 | 1.484 | 0.858 | 1.808 | 1.445 |
| | 1.180 | 2.261 | 0.405 | 0.306 | 0.232 | 0.307 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 2.5013 | 4.0293 | 4.2789 | 2.2718 | 3.2188 | 3.8058 |
| | 2.0976 | 3.2139 | 1.1397 | 1.0339 | 1.9537 | 1.4710 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.001 | 0.001 | 0.000 | 0.000 | 0.001 |
| | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.000 |

ANNUAL TOTALS FOR YEAR 18

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 53.03 | 192498.875 | 100.00 |
| RUNOFF | 9.626 | 34942.066 | 18.15 |
| EVAPOTRANSPIRATION | 12.266 | 44525.586 | 23.13 |
| DRAINAGE COLLECTED FROM LAYER 2 | 31.0158 | 112587.266 | 58.49 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000007 | 0.026 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0002 | | |
| CHANGE IN WATER STORAGE | 0.122 | 443.970 | 0.23 |
| SOIL WATER AT START OF YEAR | 7.702 | 27957.164 | |
| SOIL WATER AT END OF YEAR | 7.824 | 28401.133 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | -0.033 | 0.00 |

MONTHLY TOTALS (IN INCHES) FOR YEAR 19

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 1.73 | 4.74 | 3.73 | 1.27 | 1.44 | 3.57 |
| | 8.46 | 10.48 | 7.69 | 8.96 | 4.52 | 2.28 |
| RUNOFF | 0.100 | 0.867 | 0.690 | 0.158 | 0.018 | 0.304 |
| | 2.075 | 3.512 | 1.952 | 2.339 | 0.565 | 0.193 |
| EVAPOTRANSPIRATION | 0.554 | 1.125 | 0.528 | 0.389 | 0.460 | 1.099 |
| | 1.846 | 1.434 | 1.592 | 1.510 | 0.689 | 0.371 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 1.1984 | 2.7486 | 2.3875 | 0.8469 | 0.9623 | 2.1669 |
| | 4.5297 | 5.5438 | 4.1457 | 5.0931 | 3.2834 | 1.5925 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | 0.001 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 |

ANNUAL TOTALS FOR YEAR 19

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 58.87 | 213698.125 | 100.00 |
| RUNOFF | 12.773 | 46364.523 | 21.70 |
| EVAPOTRANSPIRATION | 11.598 | 42100.480 | 19.70 |

| | | | |
|---|---|---|---|
| DRAINAGE COLLECTED FROM LAYER 2 | 34.4987 | 125230.406 | 58.60 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000008 | 0.028 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0002 | | |
| CHANGE IN WATER STORAGE | 0.001 | 2.702 | 0.00 |
| SOIL WATER AT START OF YEAR | 7.824 | 28401.133 | |
| SOIL WATER AT END OF YEAR | 7.825 | 28403.836 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | -0.013 | 0.00 |

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MONTHLY TOTALS (IN INCHES) FOR YEAR 20

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 3.86 | 7.49 | 2.34 | 1.19 | 1.53 | 12.61 |
| | 7.41 | 7.62 | 4.70 | 0.11 | 1.96 | 4.50 |
| RUNOFF | 0.453 | 1.136 | 0.142 | 0.075 | 0.010 | 3.720 |
| | 2.116 | 2.605 | 1.237 | 0.000 | 0.001 | 0.950 |
| EVAPOTRANSPIRATION | 0.883 | 1.404 | 0.643 | 0.413 | 0.434 | 2.730 |
| | 1.959 | 2.006 | 0.737 | 0.053 | 0.334 | 0.630 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 2.6465 | 4.8263 | 1.5711 | 0.8095 | 1.0067 | 6.0431 |
| | 3.4081 | 3.0519 | 2.7262 | 0.0569 | 1.4312 | 3.0348 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 |
| | 0.000 | 0.000 | 0.001 | 0.000 | 0.000 | 0.000 |

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ANNUAL TOTALS FOR YEAR 20

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 55.32 | 200811.625 | 100.00 |
| RUNOFF | 12.525 | 45464.664 | 22.64 |
| EVAPOTRANSPIRATION | 12.226 | 44380.641 | 22.10 |
| DRAINAGE COLLECTED FROM LAYER 2 | 30.6923 | 111412.969 | 55.48 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000007 | 0.026 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0002 | | |
| CHANGE IN WATER STORAGE | -0.123 | -446.672 | -0.22 |
| SOIL WATER AT START OF YEAR | 7.825 | 28403.836 | |
| SOIL WATER AT END OF YEAR | 7.702 | 27957.164 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | -0.004 | 0.00 |

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MONTHLY TOTALS (IN INCHES) FOR YEAR 21

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 2.20 | 2.62 | 4.70 | 1.43 | 3.57 | 5.14 |
| | 8.00 | 8.81 | 3.09 | 4.09 | 2.13 | 2.88 |
| RUNOFF | 0.205 | 0.120 | 1.284 | 0.115 | 0.877 | 1.393 |
| | 2.595 | 2.897 | 0.359 | 1.166 | 0.155 | 0.308 |
| EVAPOTRANSPIRATION | 0.362 | 0.695 | 0.927 | 0.191 | 1.051 | 0.578 |
| | 1.407 | 1.556 | 0.747 | 0.609 | 0.729 | 0.530 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 1.6331 | 1.7106 | 2.5842 | 1.0106 | 1.7555 | 3.1695 |
| | 3.9654 | 4.3898 | 1.8731 | 2.3114 | 1.3439 | 2.0591 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.000 | 0.001 | 0.000 | 0.000 | 0.001 |
| | 0.001 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 |

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ANNUAL TOTALS FOR YEAR 21

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 48.66 | 176635.781 | 100.00 |
| RUNOFF | 11.474 | 41651.801 | 23.58 |
| EVAPOTRANSPIRATION | 9.379 | 34047.348 | 19.28 |
| DRAINAGE COLLECTED FROM LAYER 2 | 27.8062 | 100936.687 | 57.14 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000006 | 0.023 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0002 | | |
| CHANGE IN WATER STORAGE | 0.000 | 0.000 | 0.00 |
| SOIL WATER AT START OF YEAR | 7.702 | 27957.164 | |
| SOIL WATER AT END OF YEAR | 7.702 | 27957.164 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | -0.072 | 0.00 |

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MONTHLY TOTALS (IN INCHES) FOR YEAR 22

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 1.20 | 2.50 | 4.39 | 3.99 | 4.27 | 10.15 |
| | 9.45 | 6.40 | 3.88 | 4.70 | 2.54 | 1.25 |
| RUNOFF | 0.052 | 0.084 | 0.329 | 0.348 | 0.486 | 3.542 |
| | 2.896 | 1.278 | 0.738 | 1.869 | 0.201 | 0.000 |
| EVAPOTRANSPIRATION | 0.327 | 0.632 | 1.412 | 1.363 | 1.004 | 1.757 |
| | 1.561 | 1.928 | 0.700 | 0.320 | 0.647 | 0.459 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 0.8206 | 1.7036 | 2.6493 | 2.2785 | 2.7796 | 4.8504 |
| | 4.8875 | 3.3001 | 2.4427 | 2.3812 | 1.7413 | 0.7909 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.001 |
| | 0.001 | 0.000 | 0.001 | 0.001 | 0.000 | 0.000 |

ANNUAL TOTALS FOR YEAR 22

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 54.72 | 198633.562 | 100.00 |
| RUNOFF | 11.983 | 43208.840 | 21.75 |
| EVAPOTRANSPIRATION | 12.111 | 43962.918 | 22.13 |
| DRAINAGE COLLECTED FROM LAYER 2 | 30.7057 | 111461.797 | 56.11 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000007 | 0.026 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0002 | | |
| CHANGE IN WATER STORAGE | 0.000 | 0.000 | 0.00 |
| SOIL WATER AT START OF YEAR | 7.702 | 27957.164 | |
| SOIL WATER AT END OF YEAR | 7.702 | 27957.164 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | -0.019 | 0.00 |

MONTHLY TOTALS (IN INCHES) FOR YEAR 24

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 2.21 | 5.20 | 6.33 | 3.12 | 6.31 | 10.16 |
| | 10.31 | 11.52 | 0.91 | 5.47 | 3.26 | 3.11 |
| RUNOFF | 0.136 | 0.781 | 0.898 | 0.662 | 2.137 | 5.115 |
| | 1.788 | 3.302 | 0.000 | 1.689 | 0.289 | 1.171 |
| EVAPOTRANSPIRATION | 0.619 | 0.916 | 2.091 | 0.782 | 1.278 | 1.047 |
| | 3.009 | 2.637 | 0.588 | 0.660 | 0.919 | 0.319 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 1.4544 | 3.3791 | 3.4652 | 1.6752 | 2.8949 | 3.9973 |
| | 5.5127 | 5.4536 | 0.3343 | 3.1082 | 2.1809 | 1.6194 |

MONTHLY TOTALS (IN INCHES) FOR YEAR 23

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 2.29 | 4.39 | 7.22 | 6.15 | 3.89 | 5.08 |
| | 5.86 | 1.40 | 11.59 | 9.66 | 1.24 | 1.83 |
| RUNOFF | 0.344 | 0.984 | 1.019 | 1.131 | 1.353 | 1.436 |
| | 1.453 | 0.103 | 2.998 | 4.340 | 0.000 | 0.126 |
| EVAPOTRANSPIRATION | 0.247 | 0.921 | 1.786 | 1.758 | 0.664 | 1.036 |
| | 1.553 | 0.442 | 2.017 | 0.815 | 0.324 | 0.550 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 1.5779 | 2.6070 | 4.2924 | 3.3833 | 1.8738 | 2.6078 |
| | 2.8543 | 0.8551 | 6.5752 | 4.5055 | 0.9161 | 1.1546 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | 0.000 | 0.000 | 0.001 | 0.000 | 0.000 | 0.000 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.001 | 0.001 | 0.001 | 0.000 | 0.001 |
| | 0.000 | 0.000 | 0.001 | 0.001 | 0.000 | 0.000 |

ANNUAL TOTALS FOR YEAR 23

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 60.60 | 219977.984 | 100.00 |
| RUNOFF | 15.285 | 55485.750 | 25.22 |
| EVAPOTRANSPIRATION | 12.112 | 43965.273 | 19.99 |
| DRAINAGE COLLECTED FROM LAYER 2 | 33.2030 | 120526.969 | 54.79 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000007 | 0.027 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0002 | | |
| CHANGE IN WATER STORAGE | 0.000 | 0.000 | 0.00 |
| SOIL WATER AT START OF YEAR | 7.702 | 27957.164 | |
| SOIL WATER AT END OF YEAR | 7.702 | 27957.164 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | -0.041 | 0.00 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.001 | 0.000 | 0.001 | 0.000 | 0.001 |
| | 0.001 | 0.001 | 0.000 | 0.000 | 0.000 | 0.001 |

ANNUAL TOTALS FOR YEAR 24

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 67.91 | 246513.281 | 100.00 |
| RUNOFF | 17.969 | 65226.910 | 26.46 |
| EVAPOTRANSPIRATION | 14.866 | 53963.410 | 21.89 |
| DRAINAGE COLLECTED FROM LAYER 2 | 35.0752 | 127322.945 | 51.65 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000008 | 0.029 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0002 | | |
| CHANGE IN WATER STORAGE | 0.000 | 0.000 | 0.00 |
| SOIL WATER AT START OF YEAR | 7.702 | 27957.164 | |
| SOIL WATER AT END OF YEAR | 7.702 | 27957.164 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | -0.009 | 0.00 |

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MONTHLY TOTALS (IN INCHES) FOR YEAR 25

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 2.39 | 2.88 | 3.92 | 2.01 | 2.67 | 5.37 |
| | 3.09 | 8.86 | 7.74 | 4.40 | 1.64 | 1.34 |
| RUNOFF | 0.091 | 0.149 | 0.629 | 0.273 | 0.669 | 1.405 |
| | 0.558 | 3.469 | 1.027 | 0.840 | 0.022 | 0.041 |
| EVAPOTRANSPIRATION | 0.648 | 0.907 | 1.087 | 0.315 | 0.440 | 1.017 |
| | 0.643 | 1.257 | 2.158 | 0.895 | 0.533 | 0.453 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 1.6503 | 1.8223 | 2.2053 | 1.4215 | 1.5609 | 2.9300 |
| | 1.8028 | 4.2386 | 4.4276 | 2.7927 | 1.0856 | 0.8460 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 |
| | 0.000 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 |

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ANNUAL TOTALS FOR YEAR 25

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 46.31 | 168105.359 | 100.00 |
| RUNOFF | 9.172 | 33295.953 | 19.81 |
| EVAPOTRANSPIRATION | 10.354 | 37585.023 | 22.36 |
| DRAINAGE COLLECTED FROM LAYER 2 | 26.7836 | 97224.320 | 57.84 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000006 | 0.023 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0002 | | |
| CHANGE IN WATER STORAGE | 0.000 | 0.000 | 0.00 |
| SOIL WATER AT START OF YEAR | 7.702 | 27957.164 | |
| SOIL WATER AT END OF YEAR | 7.702 | 27957.164 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | 0.039 | 0.00 |

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MONTHLY TOTALS (IN INCHES) FOR YEAR 26

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 2.16 | 3.69 | 1.22 | 4.50 | 1.39 | 6.87 |
| | 11.00 | 6.10 | 2.29 | 5.10 | 1.94 | 5.84 |
| RUNOFF | 0.070 | 0.431 | 0.000 | 0.466 | 0.140 | 1.528 |
| | 4.083 | 1.176 | 0.106 | 0.734 | 0.209 | 1.535 |
| EVAPOTRANSPIRATION | 0.460 | 1.273 | 0.445 | 1.166 | 0.200 | 1.638 |
| | 2.133 | 1.735 | 0.753 | 1.222 | 0.432 | 0.748 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 1.6041 | 2.0105 | 0.7746 | 2.8687 | 1.0495 | 3.6011 |
| | 4.7964 | 3.1530 | 1.5573 | 3.1401 | 1.3025 | 3.5574 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 |
| | 0.001 | 0.000 | 0.000 | 0.001 | 0.000 | 0.001 |

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ANNUAL TOTALS FOR YEAR 26

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 52.10 | 189123.016 | 100.00 |
| RUNOFF | 10.479 | 38037.324 | 20.11 |
| EVAPOTRANSPIRATION | 12.206 | 44308.734 | 23.43 |
| DRAINAGE COLLECTED FROM LAYER 2 | 29.4151 | 106776.914 | 56.46 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000007 | 0.025 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0002 | | |
| CHANGE IN WATER STORAGE | 0.000 | 0.000 | 0.00 |
| SOIL WATER AT START OF YEAR | 7.702 | 27957.164 | |
| SOIL WATER AT END OF YEAR | 7.702 | 27957.164 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | 0.023 | 0.00 |

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MONTHLY TOTALS (IN INCHES) FOR YEAR 27

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 2.09 | 4.34 | 4.40 | 4.31 | 9.97 | 2.94 |
| | 14.07 | 4.51 | 1.84 | 0.56 | 4.26 | 3.23 |
| RUNOFF | 0.024 | 0.227 | 0.599 | 1.055 | 4.680 | 0.369 |
| | 6.345 | 0.847 | 0.129 | 0.000 | 1.283 | 0.507 |
| EVAPOTRANSPIRATION | 0.849 | 1.113 | 0.831 | 0.697 | 1.494 | 0.751 |
| | 2.018 | 1.434 | 0.413 | 0.215 | 0.439 | 0.398 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 1.2173 | 2.9966 | 2.9743 | 2.4359 | 3.9185 | 1.8203 |
| | 5.5771 | 2.3589 | 1.2981 | 0.3453 | 2.5385 | 2.3246 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.000 |
| | 0.001 | 0.000 | 0.000 | 0.000 | 0.001 | 0.001 |

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ANNUAL TOTALS FOR YEAR 27

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 56.52 | 205167.578 | 100.00 |
| RUNOFF | 16.064 | 58310.570 | 28.42 |
| EVAPOTRANSPIRATION | 10.651 | 38663.012 | 18.84 |
| DRAINAGE COLLECTED FROM LAYER 2 | 29.8055 | 108193.945 | 52.73 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000007 | 0.025 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0002 | | |
| CHANGE IN WATER STORAGE | 0.000 | 0.000 | 0.00 |
| SOIL WATER AT START OF YEAR | 7.702 | 27957.164 | |
| SOIL WATER AT END OF YEAR | 7.702 | 27957.164 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | 0.020 | 0.00 |

MONTHLY TOTALS (IN INCHES) FOR YEAR 28

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 1.65 | 1.96 | 5.02 | 2.97 | 4.84 | 2.17 |
| | 4.04 | 5.73 | 1.17 | 2.79 | 2.87 | 3.13 |
| RUNOFF | 0.136 | 0.114 | 0.313 | 0.124 | 1.113 | 0.161 |
| | 0.465 | 1.431 | 0.005 | 0.658 | 0.232 | 0.148 |
| EVAPOTRANSPIRATION | 0.450 | 0.454 | 1.373 | 1.085 | 0.734 | 0.593 |
| | 1.196 | 0.965 | 0.609 | 0.335 | 0.771 | 0.761 |

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| LATERAL DRAINAGE COLLECTED | 1.0639 | 1.3920 | 3.2217 | 1.7892 | 3.0767 | 1.4164 |
| FROM LAYER 2 | 2.3788 | 3.2142 | 0.6762 | 1.7971 | 1.8671 | 2.2193 |
| PERCOLATION/LEAKAGE THROUGH | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| TOP OF LAYER 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| STD. DEVIATION OF DAILY | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| HEAD ON TOP OF LAYER 3 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

ANNUAL TOTALS FOR YEAR 28

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 38.34 | 139174.234 | 100.00 |
| RUNOFF | 4.900 | 17788.455 | 12.78 |
| EVAPOTRANSPIRATION | 9.326 | 33852.195 | 24.32 |
| DRAINAGE COLLECTED FROM LAYER 2 | 24.1128 | 87529.555 | 62.89 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000006 | 0.022 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0001 | | |
| CHANGE IN WATER STORAGE | 0.001 | 3.967 | 0.00 |
| SOIL WATER AT START OF YEAR | 7.702 | 27957.164 | |
| SOIL WATER AT END OF YEAR | 7.703 | 27961.131 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |

| | | | | | | |
|---|---|---|---|---|---|---|
| ANNUAL WATER BUDGET BALANCE | 0.0000 | | | 0.030 | | 0.00 |

MONTHLY TOTALS (IN INCHES) FOR YEAR 29

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 1.55 | 3.85 | 7.62 | 1.02 | 5.84 | 3.83 |
| | 6.46 | 5.93 | 5.95 | 0.03 | 1.22 | 1.18 |
| RUNOFF | 0.062 | 0.743 | 2.216 | 0.006 | 2.018 | 0.513 |
| | 2.126 | 1.904 | 2.051 | 0.000 | 0.055 | 0.005 |
| EVAPOTRANSPIRATION | 0.394 | 0.642 | 1.920 | 0.284 | 0.801 | 1.289 |
| | 1.052 | 1.117 | 0.697 | 0.100 | 0.132 | 0.371 |
| LATERAL DRAINAGE COLLECTED | 1.0952 | 2.4649 | 3.4841 | 0.7299 | 3.0212 | 2.0286 |
| FROM LAYER 2 | 3.2822 | 2.9086 | 3.0798 | 0.0523 | 1.0325 | 0.8039 |
| PERCOLATION/LEAKAGE THROUGH | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| TOP OF LAYER 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| STD. DEVIATION OF DAILY | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.000 |
| HEAD ON TOP OF LAYER 3 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

ANNUAL TOTALS FOR YEAR 29

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 44.48 | 161462.375 | 100.00 |
| RUNOFF | 11.698 | 42463.711 | 26.30 |
| EVAPOTRANSPIRATION | 8.800 | 31943.229 | 19.78 |
| DRAINAGE COLLECTED FROM LAYER 2 | 23.9833 | 87059.422 | 53.92 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000006 | 0.021 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0001 | | |
| CHANGE IN WATER STORAGE | -0.001 | -3.967 | 0.00 |
| SOIL WATER AT START OF YEAR | 7.703 | 27961.131 | |
| SOIL WATER AT END OF YEAR | 7.702 | 27957.164 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | -0.048 | 0.00 |

MONTHLY TOTALS (IN INCHES) FOR YEAR 30

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | 2.85 | 4.68 | 8.38 | 3.62 | 2.65 | 5.61 |
| | 3.59 | 4.40 | 5.75 | 0.81 | 2.26 | 3.48 |
| RUNOFF | 0.189 | 0.701 | 2.511 | 0.516 | 0.335 | 1.282 |
| | 0.479 | 0.297 | 0.815 | 0.009 | 0.296 | 0.275 |

| | | | | | | |
|---|---|---|---|---|---|---|
| EVAPOTRANSPIRATION | 0.616 | 0.777 | 1.297 | 0.800 | 0.836 | 1.083 |
| | 1.301 | 1.621 | 1.792 | 0.126 | 0.411 | 0.747 |
| LATERAL DRAINAGE COLLECTED | 2.0452 | 3.1212 | 4.5719 | 2.3047 | 1.4794 | 3.2451 |
| FROM LAYER 2 | 1.8099 | 2.4810 | 3.1289 | 0.5773 | 1.5519 | 2.4572 |
| PERCOLATION/LEAKAGE THROUGH | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| LAYER 4 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGE DAILY HEAD ON | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| TOP OF LAYER 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| STD. DEVIATION OF DAILY | 0.000 | 0.000 | 0.001 | 0.000 | 0.000 | 0.000 |
| HEAD ON TOP OF LAYER 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

ANNUAL TOTALS FOR YEAR 30

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 48.08 | 174530.375 | 100.00 |
| RUNOFF | 7.784 | 28255.736 | 16.19 |
| EVAPOTRANSPIRATION | 11.407 | 41406.312 | 23.72 |
| DRAINAGE COLLECTED FROM LAYER 2 | 28.7736 | 104448.156 | 59.85 |
| PERC./LEAKAGE THROUGH LAYER 4 | 0.000007 | 0.024 | 0.00 |
| AVG. HEAD ON TOP OF LAYER 3 | 0.0002 | | |
| CHANGE IN WATER STORAGE | 0.116 | 420.165 | 0.24 |
| SOIL WATER AT START OF YEAR | 7.702 | 27957.164 | |
| SOIL WATER AT END OF YEAR | 7.817 | 28377.328 | |
| SNOW WATER AT START OF YEAR | 0.000 | 0.000 | 0.00 |
| SNOW WATER AT END OF YEAR | 0.000 | 0.000 | 0.00 |
| ANNUAL WATER BUDGET BALANCE | 0.0000 | -0.017 | 0.00 |

AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 30

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | | | | | | |
| TOTALS | 2.45 | 3.63 | 4.70 | 2.73 | 4.18 | 5.96 |
| | 7.24 | 7.26 | 4.83 | 2.68 | 2.00 | 2.89 |
| STD. DEVIATIONS | 1.74 | 1.59 | 2.10 | 1.69 | 2.34 | 3.23 |
| | 3.35 | 3.06 | 2.66 | 2.46 | 1.05 | 1.52 |
| RUNOFF | | | | | | |
| TOTALS | 0.279 | 0.504 | 0.903 | 0.371 | 1.004 | 1.633 |
| | 1.872 | 1.934 | 1.129 | 0.664 | 0.217 | 0.419 |
| STD. DEVIATIONS | 0.471 | 0.430 | 0.765 | 0.401 | 1.194 | 1.496 |
| | 1.658 | 1.248 | 1.113 | 0.977 | 0.286 | 0.461 |
| EVAPOTRANSPIRATION | | | | | | |
| TOTALS | 0.578 | 0.825 | 1.097 | 0.712 | 0.877 | 1.292 |
| | 1.807 | 1.634 | 1.036 | 0.433 | 0.399 | 0.545 |
| STD. DEVIATIONS | 0.329 | 0.295 | 0.465 | 0.485 | 0.429 | 0.656 |
| | 0.704 | 0.679 | 0.517 | 0.353 | 0.219 | 0.220 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | | | | | | |
| TOTALS | 1.6098 | 2.2921 | 2.6916 | 1.6559 | 2.3155 | 3.0399 |
| | 3.5377 | 3.6919 | 2.6714 | 1.5907 | 1.3878 | 1.9221 |
| STD. DEVIATIONS | 1.0762 | 0.9857 | 1.0837 | 0.9268 | 0.9993 | 1.3377 |
| | 1.2952 | 1.4123 | 1.3346 | 1.2778 | 0.6880 | 0.9789 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | | | | | | |
| TOTALS | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| STD. DEVIATIONS | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

| | | | | | | |
|---|---|---|---|---|---|---|
| DAILY AVERAGE HEAD ON TOP OF LAYER 3 | | | | | | |
| AVERAGES | 0.0001 | 0.0002 | 0.0002 | 0.0001 | 0.0002 | 0.0002 |
| | 0.0003 | 0.0003 | 0.0002 | 0.0001 | 0.0001 | 0.0001 |
| STD. DEVIATIONS | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |
| | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |

AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 30

| | INCHES | CU. FEET | PERCENT |
|---|---|---|---|
| PRECIPITATION | 50.57 ( 8.664) | 183580.0 | 100.00 |
| RUNOFF | 10.930 ( 3.7797) | 39675.42 | 21.612 |
| EVAPOTRANSPIRATION | 11.237 ( 1.7652) | 40791.57 | 22.220 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 2 | 28.40629 ( 3.94409) | 103114.844 | 56.16890 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.00001 ( 0.00000) | 0.024 | 0.00001 |
| AVERAGE HEAD ON TOP OF LAYER 3 | 0.000 ( 0.000) | | |
| CHANGE IN WATER STORAGE | -0.001 ( 0.0650) | -1.86 | -0.001 |

PEAK DAILY VALUES FOR YEARS 1 THROUGH 30

| | (INCHES) | (CU. FT.) |
|---|---|---|
| PRECIPITATION | 5.32 | 19311.602 |
| RUNOFF | 4.141 | 15031.2773 |
| DRAINAGE COLLECTED FROM LAYER 2 | 1.55737 | 5653.24365 |
| PERCOLATION/LEAKAGE THROUGH LAYER 4 | 0.000000 | 0.00101 |
| AVERAGE HEAD ON TOP OF LAYER 3 | 0.003 | |
| MAXIMUM HEAD ON TOP OF LAYER 3 | 0.005 | |
| LOCATION OF MAXIMUM HEAD IN LAYER 2 (DISTANCE FROM DRAIN) | 0.0 FEET | |
| SNOW WATER | 1.03 | 3735.4602 |

MAXIMUM VEG. SOIL WATER (VOL/VOL) 0.2632

MINIMUM VEG. SOIL WATER (VOL/VOL) 0.0240

*** Maximum heads are computed using McEnroe's equations. ***

Reference: Maximum Saturated Depth over Landfill Liner
by Bruce M. McEnroe, University of Kansas
ASCE Journal of Environmental Engineering
Vol. 119, No. 2, March 1993, pp. 262-270.

FINAL WATER STORAGE AT END OF YEAR 30

| LAYER | (INCHES) | (VOL/VOL) |
|---|---|---|
| 1 | 0.1301 | 0.2169 |
| 2 | 0.0013 | 0.0100 |
| 3 | 0.0000 | 0.0000 |
| 4 | 7.6060 | 0.4270 |
| SNOW WATER | 0.000 | |

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# ATTACHMENT E

# CLOSURE AND POST-CLOSURE COST ESTIMATES

# CLOSURETURF® FINAL COVER SYSTEM OPTION

**Closure Cost Estimate**

**Class Three Landfill - Largest and Most Expensive Area Requiring Closure**

**Winyah Generating Station, Georgetown County, South Carolina**

Largest landfill area requiring closure at any time: 31.3 AC Date Prepared: May 2020

| Item Number | Description | Estimated Quantity | Unit | Unit Price | Total Closure Cost |
|---|---|---|---|---|---|
| 1 | Bonds, Insurance, Mobilization and Demobilization | 5% | LS | $ 341,432 | $ 341,432 |
| 2 | Temporary Stormwater Water Management | 31.3 | AC | $ 3,249 | $ 101,690 |
| 3 | Cover Subgrade Preparation | 31.3 | AC | $ 9,747 | $ 305,069 |
| 4 | Reinforced Geosysnthetic Clay Layer (GCL) [1] | 1,363,428 | SF | $ 0.65 | $ 885,919 |
| 5 | ClosureTurf® with 50-mil SuperGripnet® | 1,363,428 | SF | $ 2.60 | $ 3,544,913 |
| 6 | Drainage Terrace Riprap Lining | 3,163 | T | $ 38.30 | $ 121,152 |
| 7 | 18" HDPE Downdrain Pipe | 2,000 | LF | $ 43.32 | $ 86,636 |
| 8 | Waste Excavation and Disposal for Downdrain Pipes | 1,375 | CY | $ 8.66 | $ 11,913 |
| 9 | Structural Fill for Downdrain Pipes | 1,250 | CY | $ 5.41 | $ 6,768 |
| 10 | Downdrain Inlets | 27 | EA | $ 2,707 | $ 73,099 |
| 11 | Downdrain Outlet Concrete Pads with Energy Dissipators | 5 | EA | $ 2,437 | $ 12,183 |
| 12 | Gravel Final Cover Access Road | 6,100 | SY | $ 29.24 | $ 178,363 |
| 13 | Miscellaneous Work & Cleanup | 31.3 | AC | $ 8,122 | $ 254,224 |
| 14 | Engineering and CQA Services | 31.3 | AC | $ 16,244 | $ 508,448 |
| 15 | 5% Contingency of Above Items | 5% | LS | $ 358,504 | $ 358,504 |
| | | | | **Total Closure Cost [1]** | **$ 6,790,312** |
| | | | | *Closure Cost per Acre [2]* | *$ 216,943* |

Notes:

1. This cost estimate is based on Final Cover System Design Option 3.

2. Closure cost per acre may be used to calculate the estimated closure cost for other areas requiring closure by taking this per-acre rate multiplied by the number of acres.

3. Costs are in 2020 dollars. For items in-common with the original 2016 Closure Cost Estimate, those unit prices were inflated to 2020 rates; for new items, 2020 unit prices were obtained.