

**Arkansas Department of Environmental Quality
NPDES PERMIT APPLICATION
FORM 1**

INSTRUCTIONS:

1. This form should be **typed or printed in ink**. If insufficient space is available to address any item please continue on an attached sheet of paper.
2. Please complete the following Section (s):

Sections	A	B	C	D	E	F	G	H	I
POTW	X	X	X	X					X
Industrial User	X	X	X	X	X	X	X		X
Construction Permit Only	X	X	*	X				X	X
Modification	X	X	X	X	X	*	*	X	X
All Other Applicants	X	X	X	X	X				X

* As necessary

3. If you need help on SIC or NAICS go to www.osha.gov/oshstats/sicser.html
4. If you have any questions about this form you may call NPDES Section at 501-682-0622 or go to www.adeq.state.ar.us/water. You may also contact :

Department
Arkansas Department of Health

Information in Regard to
Water Supply

Telephone #
501-661-2623

5. The following EPA Forms in addition to Form 1 is required for processing your application:

Form 2A - Municipal Dischargers

Form 2B - Concentrated Animal Feeding Operations

Form 2C - Existing Manufacturing, Commercial, Mining, and Silvicultural Operations

Form 2D - New Sources and New Dischargers Application for Permit to Discharge Process Wastewater

Form 2E - Facilities Which Do Not Discharge Process Wastewater (i.e. Domestic, Non contact cooling water)

Form 2F - Application for Permit to Discharge Storm Water Discharges Associated With Industrial Activity

6. Where to Submit

Return the completed form by mail to:

Arkansas Department of Environmental Quality
Permits Branch, Water Division
5301 Northshore Drive
North Little Rock, AR 72118

Or by email to:

Water-Permit-Application@adeq.state.ar.us

**NPDES PERMIT APPLICATION
FORM 1**

ARKANSAS DEPARTMENT OF ENVIRONMENTAL QUALITY
WATER DIVISION
5301 Northshore Drive
North Little Rock, AR 72118-5317
www.adeq.state.ar.us/water

PURPOSE OF THIS APPLICATION

- INITIAL PERMIT APPLICATION FOR NEW FACILITY
- INITIAL PERMIT APPLICATION FOR EXISTING FACILITY
- MODIFICATION OF EXISTING PERMIT
- REISSUANCE (RENEWAL) OF EXISTING PERMIT
- MODIFICATION AND CONSTRUCTION OF EXISTING PERMIT
- CONSTRUCTION PERMIT

SECTION A- GENERAL INFORMATION

1. Operator (Legal) Applicant Name (who has ultimate decision making responsibility over the operation of a facility or activity):

Eco-Vista, LLC

Note: The legal name of the operator must be identical to the name listed with the Arkansas Secretary of State.

2. Operator Type: Private State Federal Partnership Corporation Other

State of Incorporation: DE

3. Facility Name: Eco-Vista, LLC

4. Is the operator identified in number 1 above, the owner of the facility? Yes No

5. NPDES Permit Number (If Applicable): AR00

6. NPDES General Permit Number (If Applicable): ARG160045

7. NPDES General Storm Water Permit Number (If Applicable): ARR000231

8. Permit Numbers and/or names of any permits issued by ADEQ or EPA for an activity located in Arkansas that is presently held by the applicant or its parent or subsidiary corporation which are not listed above:

<u>Permit Name</u>	<u>Permit Number</u>	<u>Held by</u>
<u>See Attachment #1</u>		

9. Give driving directions to the wastewater treatment plant with respect to known landmarks:

10. Facility Physical Location: (Attach a map with location marked; street, route no. or other specific identifier)

Street: 2210 Waste Management Drive

City: Springdale County: Washington State: AR Zip: 72762

11. Facility Mailing Address for permit, DMR, and Invoice (Street or Post Office Box):

Name: Ms. Jodi Taylor Title: Environmental Protection Mgr.
Street: 2210 Waste Management Drive P.O. Box _____
City: Springdale State: AR Zip: 72762
E-mail address*: jtaylo28@wm.com Fax: _____

* Is emailing all documents (permit, letters, DMRs, invoices, etc.) acceptable to the applicant? Yes No

12. Neighboring States Within 20 Miles of the permitted facility (Check all that apply):

Oklahoma Missouri Tennessee Louisiana Texas Mississippi

13. Indicate applicable Standard Industrial Classification (SIC) Codes and NAICS codes for primary processes

4953/4212 SIC Facility Activity under this SIC or NAICS:
562212/325314 NAICS _____

14. Design Flow: 2.11 MGD Highest Monthly Average of the last two years Flow: NA MGD

15. Is Outfall equipped with a diffuser? Yes No

16. Responsible Official (as described on the last page of this application):

Name: Mr. David Conrad Title: Market Area Engineer
Address: 2210 Waste Management Drive Phone Number: 501-982-7336
E-mail Address: _____
City: Springdale State: AR Zip: 72762

17. Cognizant Official (Duly Authorized Representative of responsible official as describe on the last page of this application):

Name: Ms. Jodi Taylor Title: Environmental Protection Mgr.
Address: 2210 Waste Management Drive Phone Number: 501.993.8966
E-mail Address: jtaylo28@wm.com
City: Springdale State: AR Zip: 72762

18. Name, address and telephone number of active consulting engineer firm (If none, so state):

Contact Name: Jennifer Harmon
Company Name: Terracon Consultants, Inc.
Address: 25809 I-30 South Phone Number: 501-847-9292
E-mail Address: jkharmon@terracon.com
City: Bryant State: AR Zip: 72022

19. Wastewater Operator Information

Wastewater Operator Name: Jodi Taylor License number: 011266
Class of municipal wastewater operator: I II III IV
Class of industrial wastewater operator: Basic Advanced

SECTION B: FACILITY AND OUTFALL INFORMATION

1. Facility Location (All information must be based on **front door (Gate)** location of the facility):

Lat: 36 ° 8 ' 38.56 " Long: 94 ° 15 ' 20.84 " County: Washin gton Nearest Town: Tontito wn

2. **Outfall** Location (The location of the end of the pipe Discharge point.):

Outfall No. 002:

Latitude: 36 ° 08 ' 39.09 " Longitude: 94 ° 15 ' 41.11 "

Where is the collection point? at outfall

Name of Receiving Stream (i.e. an unnamed tributary of Mill Creek, thence into Mill Creek; thence into Arkansas River):

Little Wildcat Creek, thence to Clear Creek, thence to the Illinois River, thence to the Arkansas River

Outfall No. _____:

Latitude: _____ ° _____ ' _____ " Longitude: _____ ° _____ ' _____ "

Where is the collection point? _____

Name of Receiving Stream (i.e. an unnamed tributary of Mill Creek, thence into Mill Creek; thence into Arkansas River):

3. **Monitoring** Location (If the monitoring is conducted at a location different than the above **Outfall** location):

Outfall No. _____:

Lat: _____ ° _____ ' _____ " Long: _____ ° _____ ' _____ "

Outfall No. _____:

Lat: _____ ° _____ ' _____ " Long: _____ ° _____ ' _____ "

Outfall No. _____:

Lat: _____ ° _____ ' _____ " Long: _____ ° _____ ' _____ "

4. Type of Treatment system (Included all components of treatment system and Attach the process flow diagram):

Sedimentation pond

5. Do you have, or plan to have, automatic sampling equipment or continuous wastewater flow metering equipment at this facility? *

Current:	Flow Metering	<input type="checkbox"/>	Yes	Type: _____	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input checked="" type="checkbox"/>
	Sampling Equipment	<input type="checkbox"/>	Yes	Type: _____	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input checked="" type="checkbox"/>
Planned:	Flow Metering	<input type="checkbox"/>	Yes	Type: _____	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input checked="" type="checkbox"/>
	Sampling Equipment	<input type="checkbox"/>	Yes	Type: _____	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input checked="" type="checkbox"/>

If yes, please indicate the present or future location of this equipment on the sewer schematic and describe the equipment below:

6. Is the proposed or existing facility located above the 100-year flood level? Yes No

NOTE: FEMA Map must be included with this application. Maps can be ordered at www.fema.gov.

If "No", what measures are (or will be) used to protect the facility? _____

7. Population for Municipal and Domestic Sewer Systems: NA

8. Backup Power Generation for Treatment Plants

Are there any permanent backup generators? Yes No

If Yes, How many? _____ Total Horespower (hp)? _____

If No, Please explain? _____

SECTION C – WASTE STORAGE AND DISPOSAL INFORMATION

1. Sludge Disposal Method (Check as many as are applicable):

Landfill

Landfill Site Name Eco-Vista, LLC

ADEQ Solid Waste Permit No. 0290-S1-R2

Land Application: ADEQ State Permit No. _____

Septic tank Arkansas Department of Health Permit No.: _____

Distribution and Marketing: Facility receiving sludge:

Name: _____ Address: _____

City: _____ State: _____ Zip: _____ Phone: _____

Rail: _____ Pipe: _____ Other: _____

Subsurface Disposal (Lagooning):

Location of lagoon _____ How old is the lagoon? _____

Surface area of lagoon: _____ Acre Depth: _____ ft Does lagoon have a liner? Yes No

Incineration: Location of incinerator _____

Remains in Treatment Lagoon(s):

How old is the lagoon(s)? _____ Has sludge depth been measured? Yes No

If Yes, Date measured? _____ Sludge Depth? _____ ft If No, When will it be measured? _____

Has sludge ever been removed? Yes No If Yes, When was it removed? _____

Other (Provide complete description): _____

SECTION D - WATER SUPPLY

Water Sources (check as many as are applicable):

Private Well - Distance from Discharge point: Within 5 miles Within 50 miles

Municipal Water Utility (Specify City): _____

Distance from Discharge point: Within 5 miles Within 50 miles

Surface Water- Name of Surface Water Source: Beaver Lake is within approximately 16.5 miles

Distance from Discharge point: Within 5 miles Within 50 miles

Lat: _____ ° _____ ' _____ " Long: _____ ° _____ ' _____ "

Other (Specify): _____

Distance from Discharge point: Within 5 miles Within 50 miles

SECTION E: FINANCIAL ASSURANCE AND DISCLOSURE STATEMENT

1. Act 409 of the 2009 Regular Session of the Arkansas Legislature (Act 409) provides for financial assurance requirements for permitting non-municipal domestic sewage treatment systems. Arkansas Code 8-4-203 (b)(1)(A)(i) – “The department shall not issue, modify, or renew a National Pollutant Discharge Elimination System permit or state permit for a non-municipal domestic sewage treatment works without the permit applicant first demonstrating to the department its financial ability to cover the estimated costs of operating and maintaining the non-municipal domestic sewage treatment works for a minimum period of five (5) years.”

The applicant must provide a detailed estimate of the operation and maintenance (O&M) costs for the facility for a five year period. Once the O&M estimate is approved, the applicant must provide **financial assurance** in order to show that the facility is able to cover the costs of operating and maintaining the treatment system for the next five years.

The minimal financial assurance may be demonstrated to the department by using the following as outlined in Arkansas Code 8-4-203(b)(2):

- A. Obtaining insurance that specifically covers operation and maintenance costs
 - B. Obtaining a letter of credit;
 - C. Obtaining a surety/performance bond;
 - D. Obtaining a trust fund or an escrow account; or
 - E. Using a combination of insurance, letter of credit, surety bond, trust fund, or escrow account.
2. Disclosure Statement:

Arkansas Code Annotated Section 8-1-106 requires that all applicants for any type of permit or transfer of any permit, license, certification or operational authority issued by the Arkansas Department of Environmental Quality (ADEQ) file a Disclosure Statement with their application. The filing of a Disclosure Statement is mandatory. No application can be considered administratively complete without a completed Disclosure Statement. The form may be obtained from the ADEQ web site at:

http://www.adeg.state.ar.us/disclosure_stmt.pdf

SECTION F – INDUSTRIAL ACTIVITY

1. Does an effluent guideline limitation promulgated by EPA ([Link to a Listing of the 40 CFR Effluent Limit Guidelines](#)) under Section 304 of the Clean Water Act (CWA) apply to your facility?

YES (Answer questions 2 and 3) NO

2. What Part of 40 CFR? _____

3. What Subpart(s)? _____

4. Give a brief description of all operations at this facility including primary products or services (attach additional sheets if necessary):

5. Production: (projected for new facilities)

Product(s) Manufactured	Last 12 Months		Highest Production Year of Last 5 Years	
	lbs/day*		lbs/day*	
(Brand name)	Highest Month	Days of Operation	Monthly Average	Days of Operation

* These units could be off-lbs, lbs quenched, lbs cleaned/etched/rinsed, lbs poured, lbs extruded, etc.

SECTION H - TECHNICAL INFORMATION

Technical information to support this application shall be furnished in appropriate detail to understand the project. Information in this Part is required for obtaining a **construction permit** or for **modification** of the treatment system.

1. Describe the treatment system. Include the types of control equipment to be installed along with their methods of operation and control efficiency.

Sedimentation pond. The outfall will be constructed of a 36 inch diameter vertical riser pipe with a trash rack inlet grate and a 12 inch diameter discharge pipe. The discharge will be controlled via a gate valve. The outlet will have a riprapped channel. The pond will also be constructed with an emergency spillway.

2. One set of construction plans and specifications, approved (Signed and stamped) by a **Professional Engineer (PE)** registered in **Arkansas**, must be submitted as follows:
 - a. The plans must show flow rates in addition to pertinent dimensions so that detention times, overflow rates, and loadings per acre, etc. can be calculated.
 - b. Specifications and complete design calculations.
 - c. All treated wastewater discharges should have a flow measuring device such as a weir or Parshall flume installed. Where there is a significant difference between the flow rates of the raw and treated wastewater, a flow measuring device should be provided both before and after treatment.
3. If this application includes a construction permit disturbing five or more acres, a storm water construction permit must be obtained by submitting a notice of intent (NOI) to ADEQ.

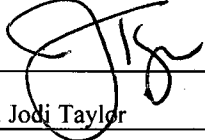
SECTION I: SIGNATORY REQUIREMENTS

Cognizant Official (Duly Authorized Representative)

40 CFR 122.22(b) states that all reports required by the permit, or other information requested by the Director, shall be signed by the applicant (or person authorized by the applicant) or by a duly authorized representative of that person. A person is duly authorized representative only if:

- (1) the authorization is made in writing by the applicant (or person authorized by the applicant);
- (2) the authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity responsibility, or an individual or position having overall responsibility for environmental matters for the company.

The applicant hereby designates the following person as a Cognizant Official, or duly authorized representative, for signing reports, etc., including Discharge Monitoring Reports (DMR) required by the permit, and other information requested by the Director:

Signature of Cognizant Official:  Date: 11.15.13

Printed name of Cognizant Official: Ms. Jodi Taylor

Official title of Cognizant Official: Environmental Protection Mgr. Telephone Number: 501.993.8966/501.982.7
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Responsible Official

The information contained in this form must be certified by a responsible official as defined in the "signatory requirements for permit applications" (40 CFR 122.22).


Responsible official is defined as follows:

- Corporation**, a principal officer of at least the level of vice president
- Partnership**, a general partner
- Sole proprietorship**: the proprietor
- Municipal, state, federal, or other public facility**: principal executive officer, or ranking elected official.

____ (Initial) "I certify that the cognizant official designated above is qualified to act as a duly authorized representative under the provisions of 40 CFR 122.22(b)." NOTE: If no duly authorized representative is designated in this section, the Department considers the applicant to be the responsible official for the facility and only reports, etc., signed by the applicant will be accepted by the Department.

____ (Initial) "I certify that, if this facility is a corporation, it is registered with the Secretary of State in Arkansas. Please provide the full name of the corporation if different than that listed in Section A above."

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment for knowing violations. I further certify under penalty of law that all analyses reported as less than detectable in this application or attachments thereto were performed using the EPA approved test method having the lowest detection limit for the substance tested."

Signature of Responsible Official:  Date: 11/15/2013

Printed name of Responsible Official: Mr. David Conrad

Official title of Responsible Official: Market Area Engineer Telephone Number: 501.804.0806/501.982.7
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ADEQ

ARKANSAS
Department of Environmental Quality

NOTICE OF INTENT NPDES GENERAL PERMIT ARG160000 OPERATORS DISCHARGING SANITARY LANDFILL RUNOFF

The attached form can be used by all persons desiring coverage under NPDES general permit ARG160000 (Operators Discharging Sanitary Landfill Runoff). The form should be completed and submitted to this Department in accordance with Part 1.3 of the general permit.

Be sure to read the Permit No. ARG160000. It describes what constitutes coverage under this permit, effluent requirements, discharge limitations, and other standard conditions that are applicable to this permit. A copy of the permit, fact sheet and other information for this permit can be obtained on the Department's website: http://www.adeq.state.ar.us/water/branch_permits/general_permits/default.htm

If you have any questions concerning the ARG160000 permit information or Notice of Intent, please contact General Permits Section of the Water Division at (501) 682-0623.

REMEMBER THE FOLLOWING:

1. The Notice of Intent (NOI) must be complete. Do not leave any question blank; use "NA" if a question is not applicable. Outfall information must be completed; it cannot be blank or "NA".
2. A Topographic map showing the location of the discharge points must be attached to the Notice of Intent at the time of submission.
3. Read the Certification.
4. A \$400.00 Check payable to ADEQ (Re: ARG160000).
5. A Disclosure form. Arkansas Code Annotated Section 8-1-106 requires that all applicants for the issuance or transfer of any permit, license, certification or operational authority issued by the Arkansas Department of Environmental Quality (ADEQ) file a disclosure statement with their applications. The filing of a disclosure statement is mandatory. No application can be considered complete without one. A new disclosure statement must be submitted even if one is already on file with the Department. The form may be obtained from ADEQ web site at: http://www.adeq.state.ar.us/disclosure_stmt.pdf

Please call the following number if you have any questions on this Form:

<u>Topic</u>	<u>Contact person</u>	<u>Phone Number</u>
Area Map and USGS Hydrologic Unit Code	Department of the Interior United States Geological Survey	(501)296-1877
Domestic Drinking Water Supply Intake	Department of Health	(501)661-2623
General Information	Permits Branch	(501)682-0623

WATER DIVISION
5301 NORTHSHORE DRIVE / NORTH LITTLE ROCK, ARKANSAS 72118
PHONE 501-682-0623 / FAX 501-682-0880
www.adeq.state.ar.us

ARKANSAS DEPARTMENT OF ENVIRONMENTAL QUALITY
NOTICE OF INTENT
LANDFILL SANITARY DISCHARGE
NPDES GENERAL PERMIT ARG160000

Application Type: New Renewal (Permit # ARG16 _____) Other Additional Outfall

I. PERMITTEE/OPERATOR INFORMATION

Permittee (Legal Name): Eco-Vista, LLC Operator Type:
Permittee Mailing Address: 2210 Waste Management Drive State Partnership
Permittee City: Springdale Federal Corporation*
Permittee State: AR Zip: 72762 Sole Proprietorship/Private
Permittee Telephone Number: 479-361-2069 *State of Incorporation: DE
Permittee Fax Number: 479-361-5934 The legal name of the Permittee must be
Permittee E-mail Address: Jtaylor28@wm.com identical to the name listed with the Arkansas
Secretary of State.

II. INVOICE MAILING INFORMATION

Invoice Contact Person: Jodi Taylor City: North Little Rock
Invoice Mailing Company: Waste Management State: AR Zip: 72117
Invoice Mailing Address: 100 Two Pine Drive Telephone: 501-982-7336

III. FACILITY INFORMATION

Facility Name: Eco-Vista Landfill Facility Contact Person: Jodi Taylor
Facility Address: 2210 Waste Management Drive Telephone Number: 501-982-7336
Driving Directions to Facility: From Hwy 412 West in Tontitown, south on South Barrington Road, west on Arbor Acres Road to facility entrance on the south side of Arbor Acres Road.
Facility County: Washington Facility City, State & Zip: Springdale, AR 72762
Facility Latitude: 36 ° 08' 38.56 " Facility Longitude: 94 ° 15 '20.84 "
Accuracy: _____ Method: _____ Datum: WGS84 Scale: NA Description: Entrance
Facility SIC Code: 4953 Facility NAICS: 562212

IV. DISCHARGE INFORMATION

Outfall Number: 002 Estimated Flow: 2.11 MGD (MillionGallons per Day)
The outfall will be constructed of a 36 inch diameter vertical riser pipe with a trash rack inlet grate and a 12 inch diameter discharge pipe. The discharge will be controlled via a gate valve. The outlet will have a riprapped channel. The pond will also be constructed with an emergency spillway.
Outfall Description: _____
Stream Segment: _____ Hydrologic Basin Code: _____
Outfall Latitude: 36 ° 08 ' 39.09 " Outfall Longitude: 94 ° 15 ' 41.11 "
Accuracy: _____ Method: _____ Datum: WGS84 Scale: NA Description: Outfall
Receiving Stream: Little Wildcat Creek, thence to Clear Creek, thence to the Illinois River, thence to the Arkansas River

WATER DIVISION
5301 NORTSHORE DRIVE / NORTH LITTLE ROCK, ARKANSAS 72118
PHONE 501-682-0623 / FAX 501-682-0880
www.adeg.state.ar.us

V. FACILITY PERMIT INFORMATION

NPDES Individual Permit Number (If Applicable): AR00
 NPDES General Permit Number (If Applicable): ARG160045
 ARG16 C (application has been submitted along with this update)
 State Construction Permit Number: ARR15
 NPDES General Construction Stormwater Permit Number (If Applicable): ARR15
 NPDES Industrial Stormwater General Permit Number: ARR000231
 Other Department Permits: _____

VI. OTHER INFORMATION:

Additional Location Description: _____
 This NOI is for the addition of a future pond outfall on the north portion of the facility.
 Additional Comments: _____
 Consultant Contact Name: Jennifer Harmon, Terracon Consultants, Inc.
 Consultant Email Address: jkharmon@terracon.com
 Consultant Address: 25809 I-30 S City: Bryant State: AR Zip: 72202
 Consultant Phone Number: 501.847.9292 Consultant Fax Number: 501.847.9210

VII. CERTIFICATION OF OPERATOR

"I certify that, if this facility is a corporation, it is registered with the Secretary of the State of Arkansas. I certify that the cognizant official designated in this Application is qualified to act as a duly authorized representative under the provisions of 40 CFR 122.22(b). If no cognizant official has been designated, I understand that the Department will accept reports signed only by the Applicant. I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Responsible Official Printed Name: Mr. David Conrad Title: Market Area Engineer
 Responsible Official Signature: *David Conrad* Date: 11/15/2013
 Responsible Official Email: dconrad@wm.com

Cognizant Official Printed Name: Ms. Jodi Taylor Title: Environmental Protection Mgr.
 Cognizant Official Signature: *Jodi Taylor* Telephone: 501-982-7336
 Cognizant Official Email: jtaylor@wm.com

X. PERMIT REQUIREMENT VERIFICATION

Please check the following to verify completion of permit requirements. If you answer "NO" to any of questions below the application will be considered incomplete and cause a delay in the permitting process.

	Yes	No	
Submittal of Complete NOI?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Submittal of Required Permit Fee?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	New Permittees Only Check Number: _____ Maps have been included with the Construction Permit Application
Submittal of Topographic Map?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Submittal of Disclosure Statement?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

WATER DIVISION
 5301 NORTSHORE DRIVE / NORTH LITTLE ROCK, ARKANSAS 72118
 PHONE 501-682-0623 / FAX 501-682-0880
 www.adeg.state.ar.us

Industrial Operator's License Number: _____

WATER DIVISION
5301 NORTSHORE DRIVE / NORTH LITTLE ROCK, ARKANSAS 72118
PHONE 501-682-0623 / FAX 501-682-0880
www.adeg.state.ar.us

ADEQ

ARKANSAS
Department of Environmental Quality

INSTRUCTIONS

I. How to Determine Latitude and Longitude:

If a physical address is known go to www.terraserver-usa.com and proceed with the following steps:

1. Select Advanced Find
2. Select Address
3. Input address
4. Click on Aerial Photo
5. Click on the Info link at the top of the page
6. Note the Latitude and Longitude are in Decimal Coordinates.
7. Go to www.geology.enr.state.nc.us/gis/latlon.html to convert coordinates to Degrees, Minutes, and Seconds.

NOTE: If a physical address does not exist you may find the coordinates in the Legal Description of the property.

II. How to Determine the Accuracy, Method, Datum, Scale, and Description for the Facility/Outfall Latitude and Longitude:

Horizontal Accuracy Measure – This indicates the accuracy, **in meters**, of the latitude/longitude location, or how close the specific latitude/longitude location is guaranteed to be to the real-world location. It is typically a function of the method used to obtain the latitude/longitude.

Horizontal Collection Method - The text that describes the method used to determine the latitude and longitude coordinates for a point on the earth.

Address Matching-House Number	Public Land Survey-Quarter Section
Address Matching-Block Face	Public Land Survey-Section
Address Matching-Street Centerline	Classical Surveying Techniques
Address Matching-Nearest Intersection	Zip Code-Centroid
Address Matching-Digitized	Unknown
Address Matching-Other	GPS-Unspecified
Census Block-1990-Centroid	GPS with Canadian Active Control System
Census Block/Group-1990-Centroid	Interpolation-Digital Map Source (TIGER)
Census Block/Tract-1990-Centroid	Interpolation-SPOT
Census-Other	Interpolation-MSS
GPS Carrier Phase Static Relative Position	Interpolation-TM
GPS Carrier Phase Kinematic Relative Position	Public Land Survey-Eighth Section
GPS Code (Pseudo Range) Differential	Public Land Survey-Sixteenth Section
GPS Code (Pseudo Range) Precise Position	Public Land Survey-Footing
GPS Code (Pseudo Range) Standard Position (SA Off)	Zip+4 Centroid
GPS Code (Pseudo Range) Standard Position (SA On)	Zip+2 Centroid
Interpolation-Map	Loran C
Interpolation-Photo	Interpolation-Other
Interpolation-Satellite	

WATER DIVISION
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www.adeq.state.ar.us

Horizontal Reference **Datum** - The code that represents the reference datum used in determining latitude and longitude coordinates.

Unknown	WGS84
NAD27	NAD83

Source Map **Scale** - The scale used to determine the latitude and longitude coordinates.

Not Applicable	1:62,500
Unknown	1:63,000
1:15,840	1:63,350
1:20,000	1:63,360
1:24,000 (1" = 2,000')	1:100,000
1:25,000	1:250,000

Reference Point **Description** - The place for which geographic coordinates were established.

Facility/Station Building Entrance or Street Address	Facility Center/Centroid
Boundary Point	Intake Point
Treatment/Storage Point	Release Point
Monitoring Point	Other

III. How to Determine your Hydrologic Basin Code for the Facility/Outfall:

1. Locate the county of your facility on the map on Page 7.
2. Find the numbered segment overlaying the county. For example 2C overlays most of Saline County.
3. Find the Eight Digit Hydrologic Basin Code located inside the numbered segment.

IV. How to Determine your Stream Segment for the Facility/Outfall:

1. Locate the county of your facility on the map on Page 7.
2. Find the numbered Stream Segment overlaying the county. For example 2C overlays most of Saline County. 2C would be the Stream Segment for any facility located within that segment.

V. How to Determine your Ultimate Receiving Waters:

1. Locate the county of your facility on the map on Page 7.
2. Find the numbered segment overlaying the county. For example 2C overlays most of Saline County.
3. Match the number from the segment to one of the numbered Ultimate Receiving Waters. For example: A facility located in Western Saline County is in segment 2C. The "2" determines that the Ultimate Receiving Water for the project is the Ouachita River.

VI. Signatory Requirements: The information contained in this form must be certified by a **responsible official** as defined in the "signatory requirements for permit applications" (40 CFR 122.22).

Responsible official is defined as follows:

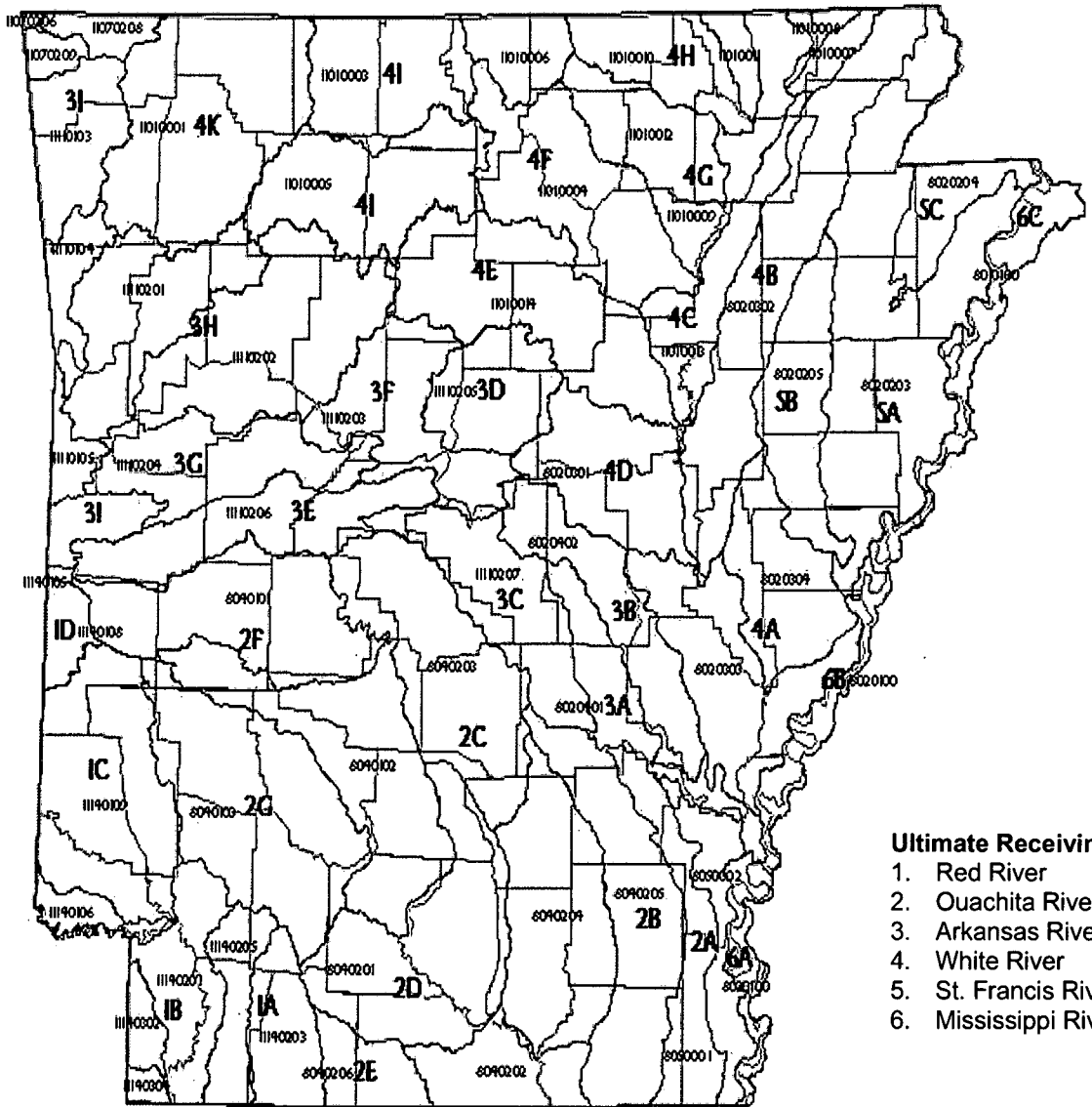
Corporation, a principal officer of at least the level of vice president, treasurer

Partnership, a general partner

Sole proprietorship: the proprietor/owner

Municipal, state, federal, or other public facility: principal executive officer, or ranking elected official

WATER DIVISION
5301 NORTHSORE DRIVE / NORTH LITTLE ROCK, ARKANSAS 72118
PHONE 501-682-0623 / FAX 501-682-0880
www.adeq.state.ar.us



Ultimate Receiving Waters

1. Red River
2. Ouachita River
3. Arkansas River
4. White River
5. St. Francis River
6. Mississippi River

WATER DIVISION
 5301 NORTSHORE DRIVE / NORTH LITTLE ROCK, ARKANSAS 72118
 PHONE 501-682-0623 / FAX 501-682-0880
www.adeq.state.ar.us

Stormwater Management Plan

Eco-Vista, LLC
ADEQ Permit No. 0290-S1-R2
AFIN: 72-00144

November 2013
Project No. 35097120



PREPARED FOR:
Eco-Vista, LLC
2210 Waste Management Drive
Springdale, AR 72762
479.361.2063

PREPARED BY:
Terracon Consultants, Inc.
25809 Interstate 30 South
Bryant, Arkansas 72022
501.847.9292

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Terracon

Geotechnical Environmental Construction Materials Facilities

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ATTACHMENTS

- Attachment A Facility Drawings
Attachment B North Pond Calculations

1.0 GENERAL

This Stormwater Management Plan presents site specific methods and procedures for the design, construction and operation of the Eco-Vista Class 1 Landfill (Facility) Stormwater North Retention Pond to be constructed in the fall of 2014 or spring of 2015 depending upon the timing of the solid waste permit expansion issuance. The Stormwater Management Plan has been developed to conform with applicable 10 State Standards and Arkansas State Regulations. The Stormwater Management Plan will be updated as required to reflect current operations and regulations. Revisions to the Stormwater Management Plan will be submitted to the Arkansas Department of Environmental Quality (ADEQ) for approval. The construction of the complete pond may be in phases as construction of the future cells progresses.

1.1 LOCATION

The north stormwater retention pond will be located on the northern portion of the facility, just to the west of the facility entrance road. This location has been cleared previously and used as a borrow area. The pond will collect stormwater from future cells. Please see **Attachment A – Drawing 8** for the site layout drawing.

1.2 GROUNDWATER SEPARATION

Stormwater routed to the pond will be runoff from the inactive cells of the landfill. Groundwater levels range from ELEV. 1230 to 1235 feet. The pond bottom is located at ELEV 1280 feet. Groundwater elevation was interpolated based on the Historic High Groundwater Elevation Map dated 10-30-13 (**Attachment A – Figure 4.6**), which was the most recent available potentiometric map available at the time of design. Based on the interpolation, the minimum separation distance has been met.

2.0 BASIS OF DESIGN

2.1 POND SHAPE

The northern pond is an “L” shape and has a capacity of approximately 2,704,024 ft³ or 20,226,105 gallons.

2.2 CALCULATIONS

As required by the Boston Mountain Solid Waste Management District, the pond has been designed to contain the run-off from a 100-year, 24-hour storm event. NPDES Sanitary Landfills General Permit (ARG160000) requires that the pond be constructed for a minimum of a 25-year, 24-hour storm event. **Attachment B** contains the output file from the Civil Storm v8i computer modeling software for a 25-year, 24-hour storm and a 100-year, 24-hour

storm for the northern pond. Perimeter ditches will route landfill stormwater to the inlet structure as indicated in Drawing No. 17.

The drainage area for the north pond is approximately 37.4 acres size and the pond is 8.6 acres in size. The 25-year, 24-hour storm fall totals are 7.2 inches over the entire 46 acres from the Civil Storm output. This rainfall event amounts to approximately 1,202,256 ft³ or 8,992,875 gallons of stormwater for the drainage area. The pond has been designed to accommodate approximately 20,226,105 gallons of stormwater which is more than adequate to contain a 25-year, 24-hour storm. The riser pipe will discharge stormwater only when the gate valve is opened.

The 100-year, 24-hour storm fall totals are 8.8 inches over the entire 46 acres from the Civil Storm output. This rainfall event amounts to approximately 1,469,424 ft³ or 10,991,292 gallons of stormwater for the drainage area. The pond has been designed to accommodate approximately 20,226,105 gallons of stormwater which is more than adequate to contain a 100-year, 24-hour storm. The riser pipe will discharge stormwater only when the gate valve is opened.

3.0 POND CONSTRUCTION DETAILS

3.1 EMBANKMENTS AND DIKES

3.1.1 Material

The perimeter dikes will be constructed of relatively impervious soil and compacted to at least 95% Standard Proctor Density in order to form a stable structure. Vegetation and other unsuitable materials will be removed from the area where the embankment is to be placed to reduce the potential for dike failure due to decomposing vegetation.

3.1.2 Top Width

The top levee width will be twenty-four (24) feet wide to accommodate vehicles.

3.1.3 Minimum and Maximum Slopes

The inner and outer slopes will be constructed at a maximum of 3:1 (H:V) slope as shown on Detail BB on Drawing 16. Where necessary, the inner slope will not be flatter than a 4:1 slope and the outer slope will be sufficient to prevent surface runoff from entering the ponds.

3.1.4 Freeboard and Design Depth

The pond would need a capacity of 662,247 ft³ for a 25-year, 24-hour rain event. At elevation 1,288 feet, the pond has a capacity of 2,704,024 ft³. The levee's lowest elevation is at 1,290 feet, thus leaving a freeboard of approximately 2 feet. The pond is considered to

be a small system due to the footprint being approximately 8.6 acres. The bottom of the pond is at elevation 1,282 feet while the emergency spill way is at elevation 1,288 feet, thus leaving operating elevation of 6 feet.

3.1.6 Erosion Control

The dikes will have a covered layer of at least 4 inch of fertile soil to promote the establishment of vegetative cover. This vegetative cover will be established prior to prefilling (Section 3.2.2) the ponds in order to minimize erosion. The discharge and maintenance pipes will discharge into an area that has been lined with geotextile and riprap in order to prevent erosion. The emergency spillway will be lined with geotextile, concrete and rip-rap in order to prevent erosion.

3.2 POND BOTTOM

3.2.1 Soil

Soil used to construct the pond bottoms (not including the seal) and dike cores shall be relatively incompressible and tight and compacted at or up to 4% above the optimum water content to at least 95% Standard Proctor Density.

3.2.2 Seal

The pond shall be constructed with a minimum 16-inch thick compacted clay liner system that has a hydraulic conductivity of less than or equal to 1×10^{-7} cm/sec as measured by undisturbed hydraulic conductivity test or a soil liner system that meets the minimum requirements of Section 93.422 of "10 State Standards". Results of a testing program which substantiates the adequacy of the proposed seal must be incorporated into and/or accompany the engineering report and submitted to the ADEQ Water Division. Standard ASTM procedures or acceptable similar methods shall be used for all tests.

3.2.2 Prefilling

Prefilling the ponds should be considered in order to protect the liner, prevent weed growth, reduce odor and maintain moisture content of the seal. However, the dikes must be prepared as described in the preceding paragraphs before the introduction of water.

3.3 MISCELLANEOUS

3.3.1 Fencing, Access and Warning Signs

Trespassing onto Facility property is prevented by gates at the entrance to the landfill along the all-weather access from Arbor Acres Road. Signs at the entrance displays the hours of

operation. The public is only allowed access to the landfill during normal operating hours. Additional fencing and signs for the stormwater pond will not be necessary to prevent the entering of livestock or trespassers.

3.3.2 Pond Level Gauges

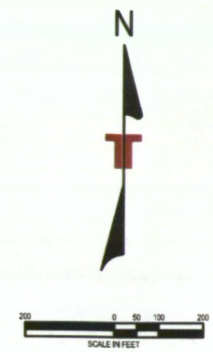
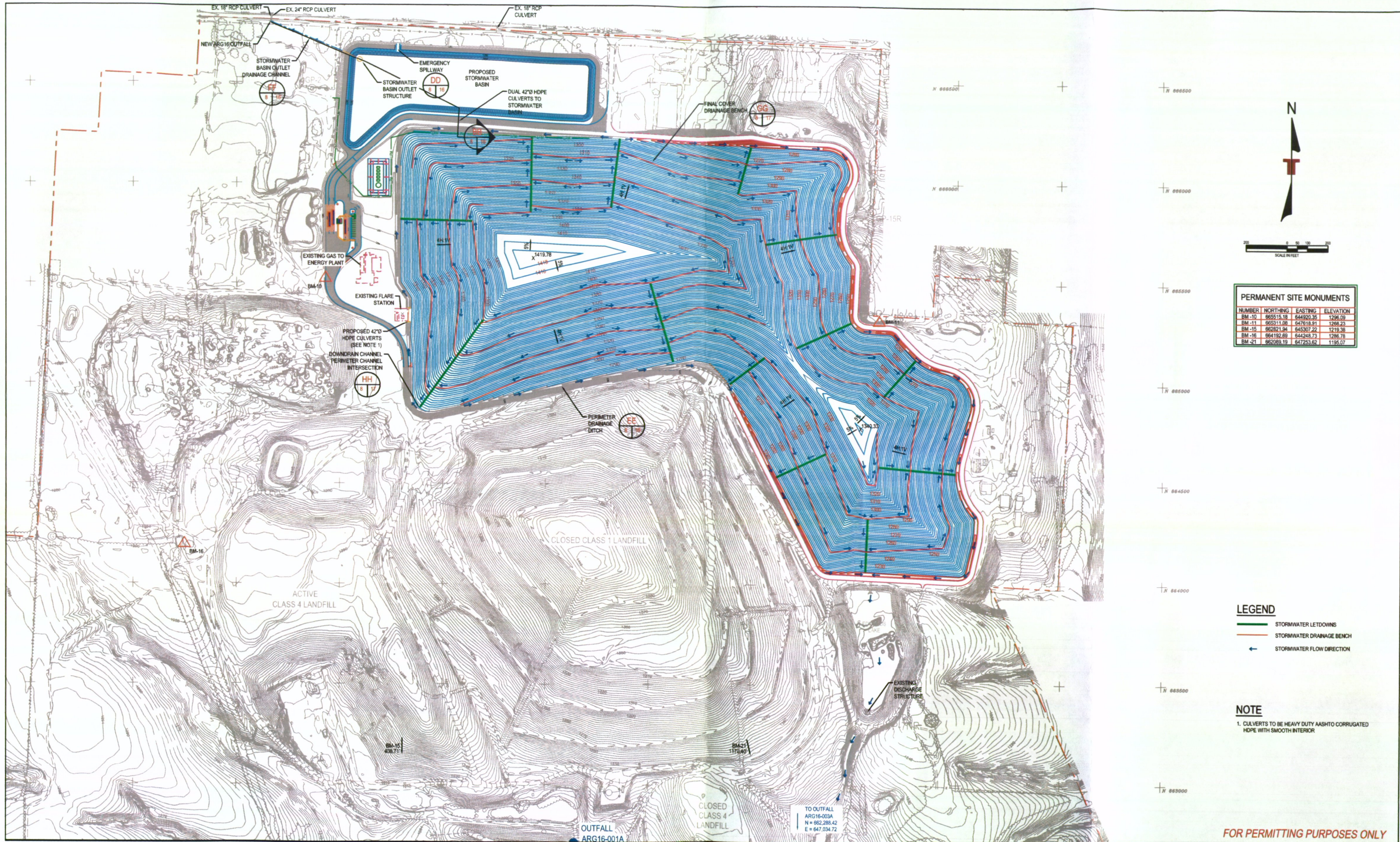
A pond level gauge will be provided in the pond that will allow easy assessment of the level of the pond water.

Stormwater Management Plan ■ Springdale, AR
Waste Management ■ Eco-Vista Class 1 Landfill
November 2013 ■ Terracon Project No. 35097120

Terracon

Attachment A

Facility Drawings



PERMANENT SITE MONUMENTS			
NUMBER	NORTHING	EASTING	ELEVATION
BM-10	665515.18	644920.35	1296.09
BM-11	665211.08	647618.91	1266.23
BM-15	662821.94	645207.22	1219.38
BM-16	664192.69	644248.73	1266.78
BM-21	662089.19	647253.62	1195.07

- LEGEND**
- STORMWATER LETDOWNS
 - STORMWATER DRAINAGE BENCH
 - ← STORMWATER FLOW DIRECTION

NOTE
 1. CULVERTS TO BE HEAVY DUTY AASHTO CORRUGATED HDPE WITH SMOOTH INTERIOR

FOR PERMITTING PURPOSES ONLY

REV.	DATE	BY	DESCRIPTION
1	10/18/13	JDW	REVISED PER M.O.D. COMMENTS FROM ADEQ ON 9.18.2013



Terracon
 Consulting Engineers and Scientists

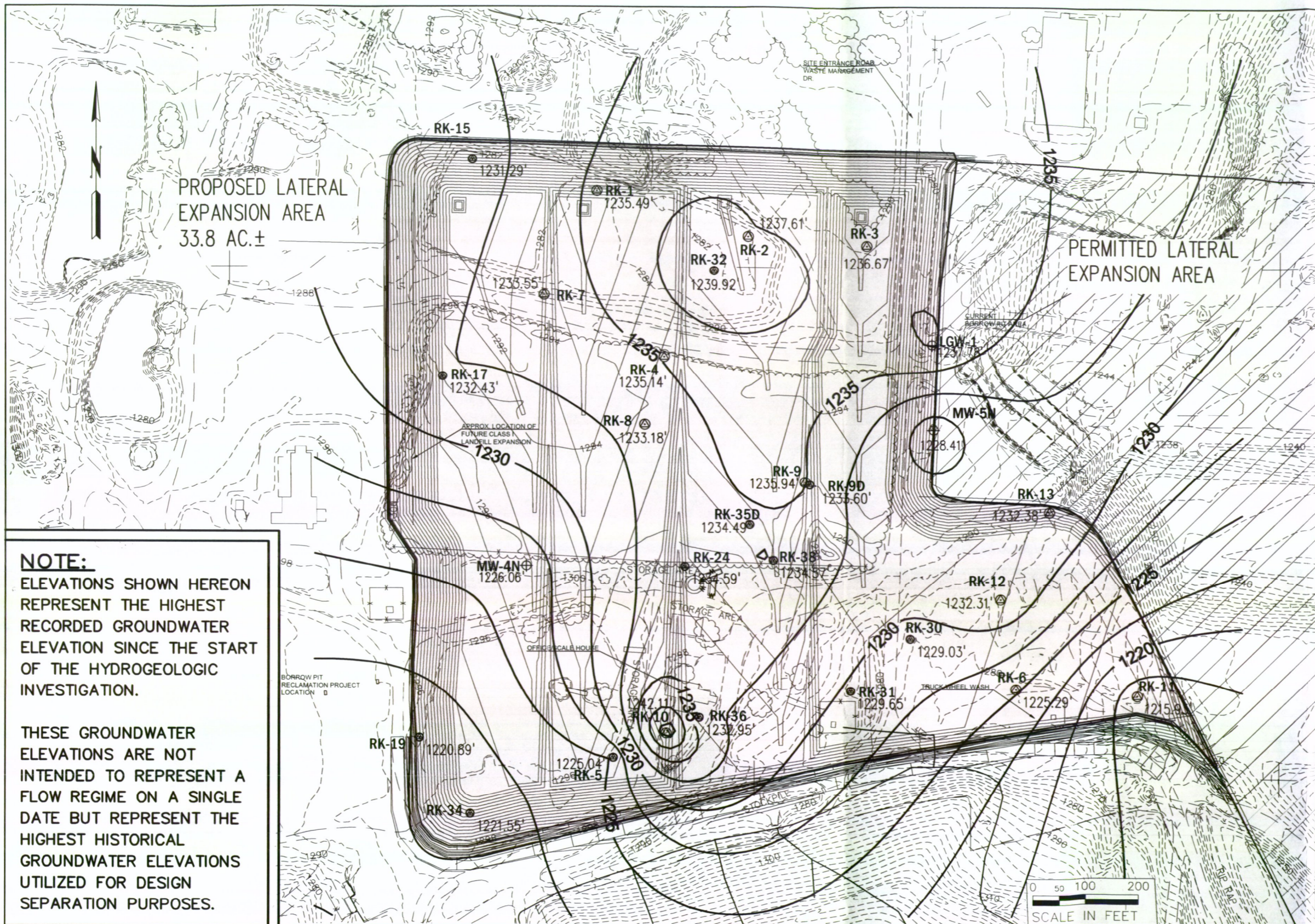
25809 I-30 SOUTH BRYANT, AR 72022
 PH. (501) 847-9292 FAX. (501) 847-9210

TO OUTFALL ARG16-003A
 N = 662,288.42
 E = 647,034.72

STORMWATER MANAGEMENT PLAN
 LATERAL EXPANSION PERMIT DRAWINGS
 ECO-VISTA, LLC
 ECO-VISTA CLASS 1 LANDFILL

SPRINGDALE ARKANSAS

DRAWING 8	
DESIGNED BY:	BNF
DRAWN BY:	TSW
APP'D BY:	BNF
SCALE:	SEE BARSCALE
DATE:	1/14/13
JOB NO.:	062-014-35297120
ACAD NO.:	032
SHEET NO.:	8 OF 18



Well	Highest Recorded Groundwater Elevation (FMSL)	Date Recorded
RK-1	1235.49	2/14/2012
RK-2	1237.61	2/14/2012
RK-3	1236.67	4/6/2012
RK-4	1235.14	4/6/2012
RK-5	1225.04	4/6/2012
RK-6	1225.29	2/14/2012
RK-7	1233.55	4/6/2012
RK-8	1233.18	4/6/2012
RK-9	1235.94	4/6/2012
RK-10	1242.11	3/6/2012
RK-11	1215.93	2/14/2012
RK-12	1232.31	5/2/2012
RK-13	1232.38	4/6/2012
MW-4N	*1226.06	7/13/2011
MW-5N	*1228.41	7/13/2011
LGW-1	**1237.78	6/1/2011
RK-9D	1233.60	8/23/2012
RK-15	1231.29	8/23/2012
RK-17	1232.43	7/18/2012
RK-19	1220.89	7/18/2012
RK-24	1234.59	7/18/2012
RK-30	1229.03	7/18/2012
RK-31	1229.65	7/18/2012
RK-32	1239.92	7/18/2012
RK-34	1221.55	7/18/2012
RK-35	1235.15	8/23/2012
RK-35D	1234.49	8/23/2012
RK-36	1232.95	8/23/2012
RK-38	1234.57	8/23/2012

NOTE:
 ELEVATIONS SHOWN HEREON REPRESENT THE HIGHEST RECORDED GROUNDWATER ELEVATION SINCE THE START OF THE HYDROGEOLOGIC INVESTIGATION.

THESE GROUNDWATER ELEVATIONS ARE NOT INTENDED TO REPRESENT A FLOW REGIME ON A SINGLE DATE BUT REPRESENT THE HIGHEST HISTORICAL GROUNDWATER ELEVATIONS UTILIZED FOR DESIGN SEPARATION PURPOSES.

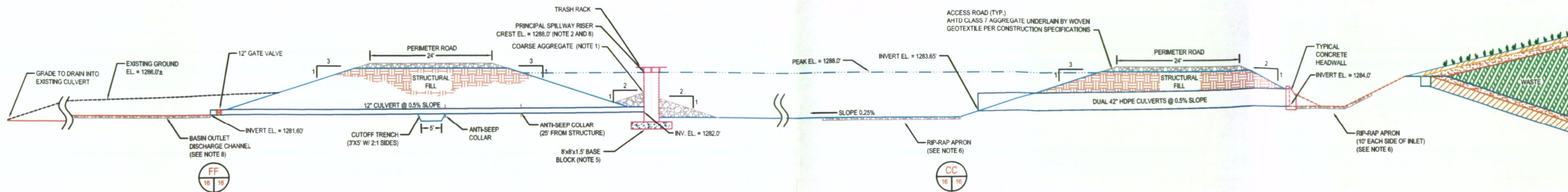
LEGEND

- PERMITTED LATERAL EXPANSION AREA
- PROPOSED LATERAL EXPANSION AREA
- NEW BORING
- EXISTING PIEZOMETER
- NEW PIEZOMETER
- PROPERTY LINE
- EXISTING INDEX CONTOURS

7529 Counts Massie Rd. N. Little Rock, AR 72113 Ph.: (501) 812-4551

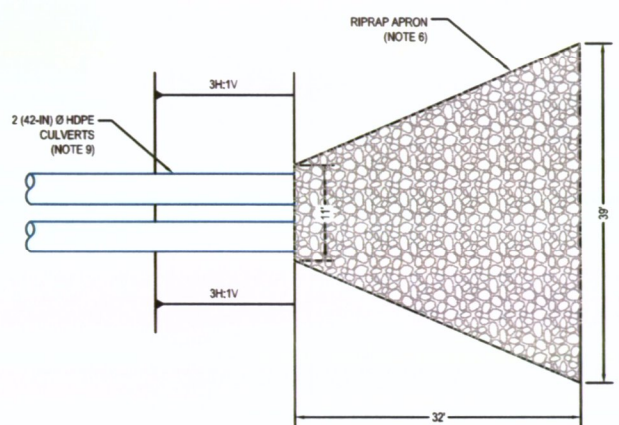
ECO VISTA LANDFILL FACILITY - HISTORIC HIGH GROUNDWATER ELEVATION MAP - FIGURE 4.6
 ECO VISTA MAJOR MODIFICATION APPLICATION
 ECO VISTA, LLC
 SPRINGDALE ARKANSAS

REVISED: 10/30/13
 JOB NO: 7-4005-0301
 ACAD NO: 037
 DWN. JKP 11/12
 SCALE: 1" = 200'
 DATE: NOVEMBER 2012



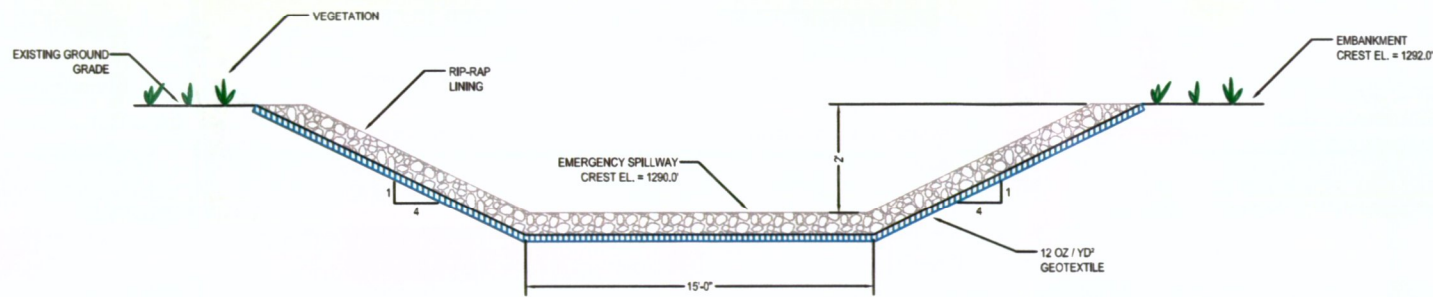
STORMWATER BASIN CROSS SECTION

DETAIL BB
SCALE: N.T.S.



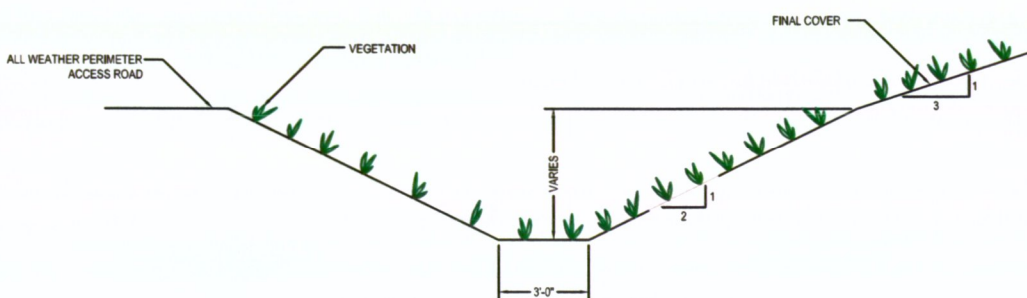
RIPRAP APRON FOR STORMWATER BASIN INLET

DETAIL CC
SCALE: N.T.S.



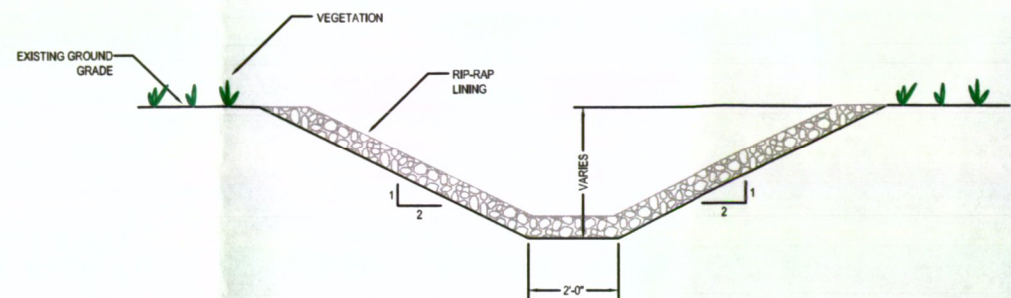
EMERGENCY SPILLWAY

DETAIL DD
SCALE: N.T.S.



PERIMETER DRAINAGE CHANNEL

DETAIL EE
SCALE: N.T.S.



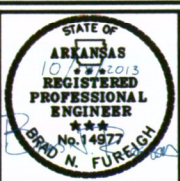
STORMWATER BASIN OUTLET DRAINAGE CHANNEL

DETAIL FF
SCALE: N.T.S.

- NOTES:
- COARSE AGGREGATE FOR PROTECTION OF SEDIMENT BASIN PRINCIPAL SPILLWAY RISER SHALL BE STONE WITH $D_{50} > 1.2"$.
 - THE PRINCIPAL SPILLWAY RISER SHALL BE 36-INCH DIAMETER ALUMINUM COATED CORRUGATED METAL PIPE (ACOMP) OR GALVANIZED STEEL PIPE.
 - THE RISER PIPE SHALL BE PERFORATED WITH 1 INCH DIAMETER DEWATERING ORIFICES, PLACED IN 8 HOLES PER ROW HORIZONTALLY. VERTICAL SPACING BETWEEN ROWS SHALL BE 6 INCHES. DEWATERING ORIFICES NOT SHOWN TO SCALE FOR CLARITY.
 - DIMENSIONS AND ELEVATIONS ARE NOMINAL UNLESS OTHERWISE INDICATED AND MAY BE ADJUSTED BASED ON FIELD CONDITIONS.
 - EMBEDMENT OF PRINCIPAL SPILLWAY RISER IN REINFORCED CONCRETE BASE SHALL BE AT LEAST 0.75'.
 - RIPRAP FOR THE BASIN INLET AND OUTLET APRONS SHALL HAVE A $D_{50} = 6"$ AND $D_{max} = 9"$ AND MAY BE REPLACED WITH AN EQUIVALENT MATERIAL. RIPRAP APRON SHALL BE A MINIMUM OF 18 INCHES IN THICKNESS AND BE UNDERLAIN BY AN 8 oz/yd² GEOTEXTILE SEPARATOR.
 - SEDIMENT CLEANOUT ELEVATION SHALL BE MARKED ON A SILT GAUGE. WHEN SEDIMENT ACCUMULATION REACHES THE MARKER OR IF THE MARKER IS OBTURED BY WATER FOR 90 DAYS, THE SEDIMENTATION BASIN SHALL BE CLEANED.
 - RIPRAP APRON SHALL HAVE $D_{50} = 12"$ AND $D_{max} = 18"$ AND MAY BE REPLACED WITH AN EQUIVALENT MATERIAL. INLET RIPRAP SHALL BE A MINIMUM OF 24 INCHES IN THICKNESS AND BE UNDERLAIN BY A 12 oz/yd² GEOTEXTILE SEPARATOR.
 - CULVERTS SHALL BE HEAVY DUTY AASHTO CORRUGATED HDPE PIPE WITH SMOOTH INTERIOR.

FOR PERMITTING PURPOSES ONLY

REV.	DATE	BY	DESCRIPTION
1	10/18/13	JDW	REVISED PER N.O.D. COMMENTS FROM ADEQ ON 9.18.2013



Terracon
Consulting Engineers and Scientists

25809 I-30 SOUTH
PH. (501) 847-8292

BRYANT, AR 72022
FAX. (501) 847-8210

SPRINGDALE

STORMWATER MANAGEMENT DETAILS - SHEET 1

LATERAL EXPANSION PERMIT DRAWINGS
ECO-VISTA, LLC.
CLASS 1 LANDFILL FACILITY

ARKANSAS

DRAWING 16

DESIGNED BY:	BNF
DRAWN BY:	JDW
APP'D BY:	BNF
SCALE:	N.T.S.
DATE:	1/14/13
JOB NO.:	062-014-35097120
ACAD NO.:	055
SHEET NO.:	16 OF 18

Attachment B

Pond Calculations

Project Inventory: Eco Vista Expansion Area 25 YR.csd

Title	Eco Vista Expansion Area Stormwater Design
Engineer	Heath Lockley
Company	Terracon Consultants, Inc.
Date	11/15/2012
Notes	

Scenario Summary

ID	88
Label	Scenario - 1
Notes	
Active Topology	<I> Base Active Topology
Physical	<I> Base Physical
Headloss	<I> Base Headloss
Boundary Condition	<I> Base Boundary Condition
Initial Settings	<I> Base Initial Settings
Hydrology	<I> Base Hydrology
Output	<I> Base Output
Inflow	<I> Base Inflow
Rainfall Runoff	<I> Base Rainfall Runoff
Water Quality	<I> Base Water Quality
Operational	<I> Base Operational
User Data Extensions	<I> Base User Data Extensions
Dynamic Solver Calculation Options	<I> Base Calculation Options

Network Inventory

Conduits	0	Pond Outlet Structures	0
Channels	3	Outfalls	1
Gutter Links	0	Wet Wells	0
Catch Basins	0	Pumps	0
Manholes	0	Catchments	6
Cross Sections	3	Ponds	1

Calculation Executive Summary

Scenario			
Label	Scenario - 1		
Storm Event			
Label	Base Rainfall Runoff	Return Event	(N/A) years
Global Storm Event	<None>		
Calculation Executive Summary			
Total Inflow Volume	3,934,979.0 gal	Total System Volume Change	3,953,382.9 gal
Total System Outflow Volume	0.0 gal	Continuity Error	0.5 %
Total System Overflow Volume	377.3 gal	Total N-R Iterations	1610
Total Gutter Volume Change	(N/A) gal		

Calculation Detailed Summary

<General>			
Label	Base Calculation Options		
Inlets			
Neglect Side Flow?	False	Active Components for Combination Inlets In Sag	Grate and Curb
Neglect Gutter Cross Slope For Side Flow?	False	Active Components for Combination Inlets on Grade	Grate and Curb
Options			
Calculation Time Step	0.025 hours	Hydrologic Time Step	0.025 hours
Output Increment	0.050 hours	Total Simulation Time	24.000 hours
Options (Advanced)			
Virtual Flow Depth	0.040 ft	NR Weighting Coefficient	0.700
Y Iteration Tolerance	0.03 ft	Relaxation Weighting Coefficient	0.600
LPI Coefficient	1.000	Computation Distance	50.00 ft

Catchment Calculation Summary

Label	Runoff Method	Loss Method	Total Rainfall Depth (in)	Area (User Defined) (acres)
CM-1	Unit Hydrograph	SCS CN	7.2	3.307
CM-2	Unit Hydrograph	SCS CN	7.2	3.473
CM-3	Unit Hydrograph	SCS CN	7.2	6.876
CM-4	Unit Hydrograph	SCS CN	7.2	6.650
CM-5	Unit Hydrograph	SCS CN	7.2	7.895
CM-6	Unit Hydrograph	SCS CN	7.2	9.192
Volume (Total Runoff) (gal)	Flow (Peak) (ft ³ /s)	Time To Peak (hours)		
369,320.7	14.07	12.100		
397,829.0	15.16	12.100		
786,629.0	29.98	12.100		
792,733.1	30.21	12.100		
535,021.7	20.39	12.100		
1,051,424.4	39.15	12.100		

General Calculation Summary

Label	Element Type	Branch	Time to Maximum Flow (hours)	Flow (Maximum) (ft ³ /s)
CH-1	Channel	2	12.100	51.94
CH-2	Channel	2	12.100	111.42
CH-3	Channel	1	12.100	27.69
CS-3	Cross Section	2	---	---
CS-4	Cross Section	2	---	---
CS-5	Cross Section	1	---	---

General Calculation Summary

Label	Element Type	Branch	Time to Maximum Flow (hours)	Flow (Maximum) (ft ³ /s)
PO-1	Pond	1	---	---

Velocity (Maximum) (ft/s)	Hydraulic Grade (Maximum) (ft)
4.45	1,290.97
6.47	1,285.78
1.99	1,285.52
---	1,295.77
---	1,286.41
---	1,286.11
---	1,283.69

Node Calculation Summary

Label	Element Type	Branch	Time to Maximum Inflow (hours)	Flow (Total In Maximum) (ft ³ /s)
OF-2	Outfall	0	(N/A)	(N/A)
PO-1	Pond	1	12.100	136.75

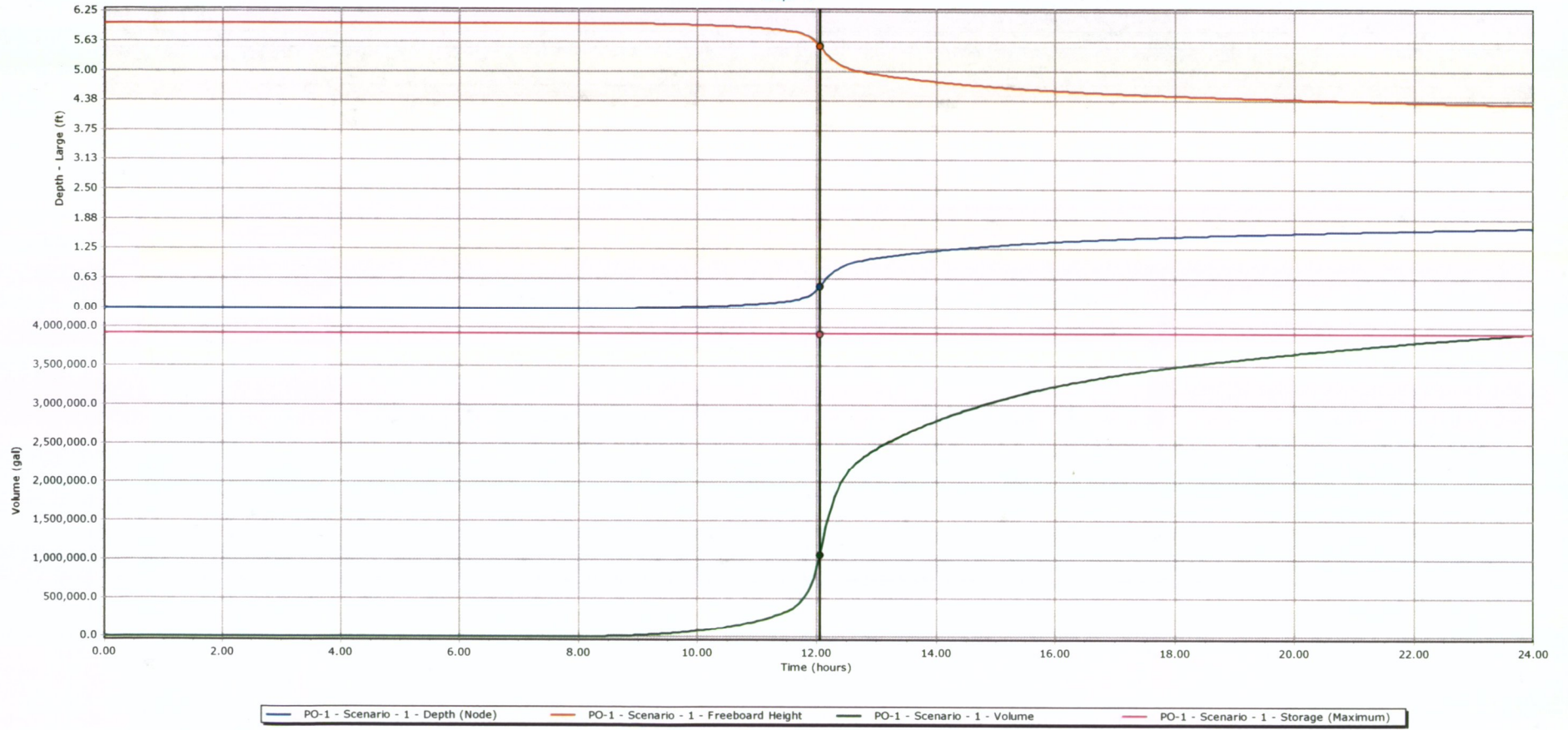
Time To Maximum Inlet Flow (hours)	Flow (Surface Maximum) (ft ³ /s)	Time To Maximum Captured Flow (hours)	Flow (Captured Maximum) (ft ³ /s)	Time to Maximum Overflow (hours)
---	---	---	---	(N/A)
---	---	---	---	0.000

Flow (Overflow Maximum) (ft ³ /s)
(N/A)
0.00

Gutter Calculation Summary

Label	Open Cross Section	Flow (Maximum) (ft ³ /s)	Time to Maximum Flow (hours)	Velocity (Maximum) (ft/s)
-------	--------------------	-------------------------------------	------------------------------	---------------------------

Graph - 2



Project Inventory: Eco Vista Expansion Area 100 YR.csd

Title	Eco Vista Expansion Area Stormwater Design
Engineer	Heath Lockley
Company	Terracon Consultants, Inc.
Date	11/15/2012
Notes	

Scenario Summary

ID	1
Label	Base
Notes	
Active Topology	Base Active Topology
Physical	Base Physical
Headloss	Base Headloss
Boundary Condition	Base Boundary Condition
Initial Settings	Base Initial Settings
Hydrology	Base Hydrology
Output	Base Output
Inflow	Base Inflow
Rainfall Runoff	Base Rainfall Runoff
Water Quality	Base Water Quality
Operational	Base Operational
User Data Extensions	Base User Data Extensions
Dynamic Solver Calculation Options	Base Calculation Options

Network Inventory

Conduits	0	Pond Outlet Structures	0
Channels	3	Outfalls	1
Gutter Links	0	Wet Wells	0
Catch Basins	0	Pumps	0
Manholes	0	Catchments	6
Cross Sections	3	Ponds	1

Calculation Executive Summary

Scenario			
Label	Base		
Storm Event			
Label	Base Rainfall Runoff	Return Event	(N/A) years
Global Storm Event	<None>		
Calculation Executive Summary			
Total Inflow Volume	5,281,983.5 gal	Total System Volume Change	5,298,323.8 gal
Total System Outflow Volume	0.0 gal	Continuity Error	0.3 %
Total System Overflow Volume	402.3 gal	Total N-R Iterations	1735
Total Gutter Volume Change	(N/A) gal		

Calculation Detailed Summary

<General>			
Label	Base Calculation Options		
Inlets			
Neglect Side Flow?	False	Active Components for Combination Inlets In Sag	Grate and Curb
Neglect Gutter Cross Slope For Side Flow?	False	Active Components for Combination Inlets on Grade	Grate and Curb
Options			
Calculation Time Step	0.025 hours	Hydrologic Time Step	0.025 hours
Output Increment	0.050 hours	Total Simulation Time	24.000 hours
Options (Advanced)			
Virtual Flow Depth	0.040 ft	NR Weighting Coefficient	0.700
Y Iteration Tolerance	0.03 ft	Relaxation Weighting Coefficient	0.600
LPI Coefficient	1.000	Computation Distance	50.00 ft

Catchment Calculation Summary

Label	Runoff Method	Loss Method	Total Rainfall Depth (in)	Area (User Defined) (acres)
CM-1	Unit Hydrograph	SCS CN	7.2	3.307
CM-2	Unit Hydrograph	SCS CN	7.2	3.473
CM-3	Unit Hydrograph	SCS CN	7.2	6.876
CM-4	Unit Hydrograph	SCS CN	7.2	6.650
CM-5	Unit Hydrograph	SCS CN	7.2	7.895
CM-6	Unit Hydrograph	SCS CN	7.2	9.192
Volume (Total Runoff) (gal)	Flow (Peak) (ft ³ /s)	Time To Peak (hours)		
506,760.3	19.11	12.100		
532,770.1	20.09	12.100		
1,053,459.1	39.72	12.100		
1,061,627.8	40.03	12.100		
716,499.1	27.01	12.100		
1,408,088.1	52.01	12.100		

General Calculation Summary

Label	Element Type	Branch	Time to Maximum Flow (hours)	Flow (Maximum) (ft ³ /s)
CH-1	Channel	2	12.100	69.47
CH-2	Channel	2	12.100	148.86
CH-3	Channel	1	12.100	37.09
CS-3	Cross Section	2	---	---
CS-4	Cross Section	2	---	---
CS-5	Cross Section	1	---	---

General Calculation Summary

Label	Element Type	Branch	Time to Maximum Flow (hours)	Flow (Maximum) (ft ³ /s)
PO-1	Pond	1	---	---
Velocity (Maximum) (ft/s)	Hydraulic Grade (Maximum) (ft)			
4.79	1,291.23			
7.04	1,286.09			
2.17	1,285.79			
---	1,296.04			
---	1,286.74			
---	1,286.40			
---	1,284.25			

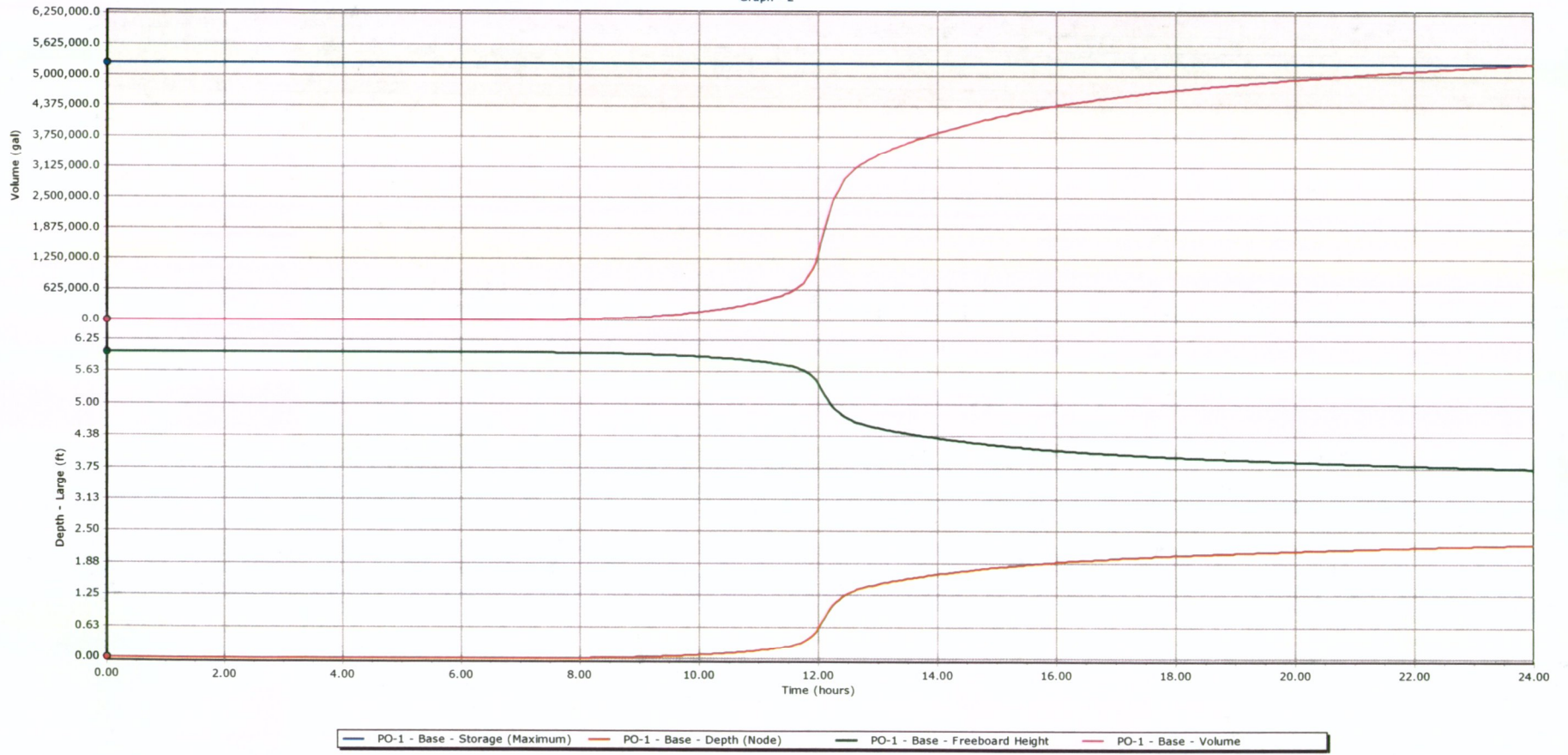
Node Calculation Summary

Label	Element Type	Branch	Time to Maximum Inflow (hours)	Flow (Total In Maximum) (ft ³ /s)
OF-2	Outfall	0	(N/A)	(N/A)
PO-1	Pond	1	12.100	183.76
Time To Maximum Inlet Flow (hours)	Flow (Surface Maximum) (ft ³ /s)	Time To Maximum Captured Flow (hours)	Flow (Captured Maximum) (ft ³ /s)	Time to Maximum Overflow (hours)
---	---	---	---	(N/A)
---	---	---	---	0.000
Flow (Overflow Maximum) (ft ³ /s)				
(N/A)				
0.00				

Gutter Calculation Summary

Label	Open Cross Section	Flow (Maximum) (ft ³ /s)	Time to Maximum Flow (hours)	Velocity (Maximum) (ft/s)

Graph - 2



Worksheet for Mid-Slope Berm

Project Description

Friction Method Manning Formula
Solve For Discharge

Input Data

Roughness Coefficient	0.030	
Channel Slope	0.03000	ft/ft
Normal Depth	18.00	in
Left Side Slope	2.00	ft/ft (H:V)
Right Side Slope	4.00	ft/ft (H:V)

Results

Discharge	45.98	ft ³ /s
Flow Area	6.75	ft ²
Wetted Perimeter	9.54	ft
Hydraulic Radius	8.49	in
Top Width	9.00	ft
Critical Depth	1.71	ft
Critical Slope	0.01493	ft/ft
Velocity	6.81	ft/s
Velocity Head	0.72	ft
Specific Energy	2.22	ft
Froude Number	1.39	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	in
Length	0.00	ft



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12/26/12 12:26:31 PM

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Bentley FlowMaster V8i (SELECTseries 1) [08.11.01.03]

Page 1 of 2

Worksheet for Mid-Slope Berm

GVF Input Data

Number Of Steps 0

GVF Output Data

Upstream Depth	0.00	in
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	18.00	in
Critical Depth	1.71	ft
Channel Slope	0.03000	ft/ft
Critical Slope	0.01493	ft/ft



Cross Section for Mid-Slope Berm

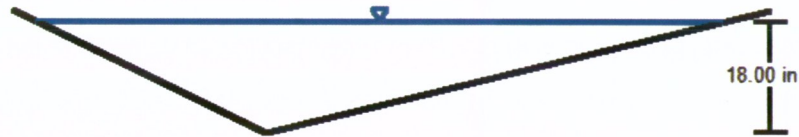
Project Description

Friction Method Manning Formula
Solve For Discharge

Input Data

Roughness Coefficient	0.030
Channel Slope	0.03000 ft/ft
Normal Depth	18.00 in
Left Side Slope	2.00 ft/ft (H:V)
Right Side Slope	4.00 ft/ft (H:V)
Discharge	45.98 ft ³ /s

Cross Section Image



V: 1
H: 1



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Bentley FlowMaster V8i (SELECTseries 1) [08.11.01.03]

Page 1 of 1

Worksheet for Letdown

Project Description

Friction Method Manning Formula
Solve For Discharge

Input Data

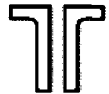
Roughness Coefficient	0.069	
Channel Slope	0.25000	ft/ft
Normal Depth	12.00	in
Left Side Slope	3.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)
Bottom Width	5.00	ft

Results

Discharge	68.33	ft ³ /s
Flow Area	8.00	ft ²
Wetted Perimeter	11.32	ft
Hydraulic Radius	8.48	in
Top Width	11.00	ft
Critical Depth	1.37	ft
Critical Slope	0.07398	ft/ft
Velocity	8.54	ft/s
Velocity Head	1.13	ft
Specific Energy	2.13	ft
Froude Number	1.77	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth 0.00 in



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Page 1 of 2

Worksheet for Letdown

GVF Input Data

Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	in
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	12.00	in
Critical Depth	1.37	ft
Channel Slope	0.25000	ft/ft
Critical Slope	0.07398	ft/ft



Cross Section for Letdown

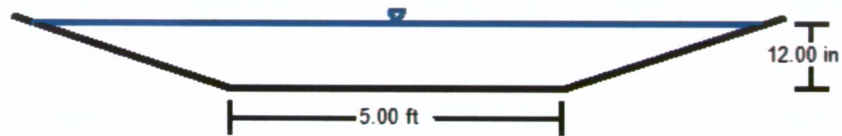
Project Description

Friction Method Manning Formula
Solve For Discharge

Input Data

Roughness Coefficient	0.069
Channel Slope	0.25000 ft/ft
Normal Depth	12.00 in
Left Side Slope	3.00 ft/ft (H:V)
Right Side Slope	3.00 ft/ft (H:V)
Bottom Width	5.00 ft
Discharge	68.33 ft ³ /s

Cross Section Image



V: 1
H: 1



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Page 1 of 1

Worksheet for Perimeter Ditch

Project Description

Friction Method Manning Formula
Solve For Discharge

Input Data

Roughness Coefficient	0.020	
Channel Slope	0.00600	ft/ft
Normal Depth	36.00	in
Left Side Slope	2.00	ft/ft (H:V)
Right Side Slope	2.00	ft/ft (H:V)
Bottom Width	3.00	ft

Results

Discharge	216.50	ft ³ /s
Flow Area	27.00	ft ²
Wetted Perimeter	16.42	ft
Hydraulic Radius	19.74	in
Top Width	15.00	ft
Critical Depth	3.08	ft
Critical Slope	0.00537	ft/ft
Velocity	8.02	ft/s
Velocity Head	1.00	ft
Specific Energy	4.00	ft
Froude Number	1.05	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth 0.00 in



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Page 1 of 2

Worksheet for Perimeter Ditch

GVF Input Data

Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	in
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	36.00	in
Critical Depth	3.08	ft
Channel Slope	0.00600	ft/ft
Critical Slope	0.00537	ft/ft



Cross Section for Perimeter Ditch

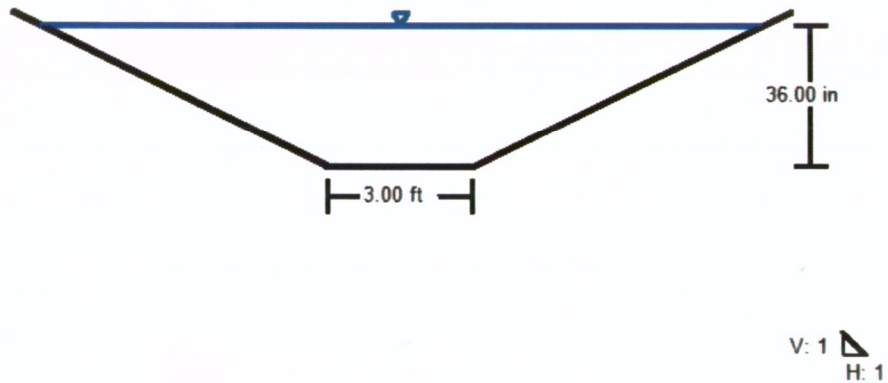
Project Description

Friction Method Manning Formula
Solve For Discharge

Input Data

Roughness Coefficient	0.020
Channel Slope	0.00600 ft/ft
Normal Depth	36.00 in
Left Side Slope	2.00 ft/ft (H:V)
Right Side Slope	2.00 ft/ft (H:V)
Bottom Width	3.00 ft
Discharge	216.50 ft ³ /s

Cross Section Image



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Bentley FlowMaster V8i (SELECTseries 1) [08.11.01.03]

Page 1 of 1

Worksheet for Pond Inlet

Project Description

Friction Method Manning Formula
Solve For Full Flow Capacity

Input Data

Roughness Coefficient	0.010
Channel Slope	0.02500 ft/ft
Normal Depth	42.00 in
Diameter	42.00 in
Discharge	206.79 ft ³ /s

Results

Discharge	206.79 ft ³ /s
Normal Depth	42.00 in
Flow Area	9.62 ft ²
Wetted Perimeter	11.00 ft
Hydraulic Radius	10.50 in
Top Width	0.00 ft
Critical Depth	3.47 ft
Percent Full	100.0 %
Critical Slope	0.02310 ft/ft
Velocity	21.49 ft/s
Velocity Head	7.18 ft
Specific Energy	10.68 ft
Froude Number	0.00
Maximum Discharge	222.45 ft ³ /s
Discharge Full	206.79 ft ³ /s
Slope Full	0.02500 ft/ft



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Bentley FlowMaster V8i (SELECTseries 1) [08.11.01.03]

Page 1 of 2

Cross Section for Pond Inlet

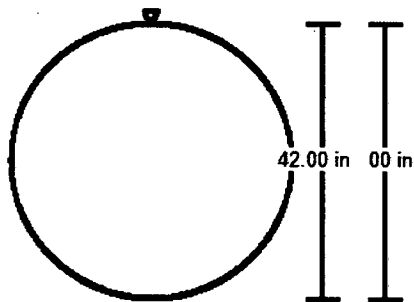
Project Description

Friction Method Manning Formula
Solve For Full Flow Capacity

Input Data

Roughness Coefficient	0.010
Channel Slope	0.02500 ft/ft
Normal Depth	42.00 in
Diameter	42.00 in
Discharge	206.79 ft ³ /s

Cross Section Image



V: 1
H: 1



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Page 1 of 1

Worksheet for Pond Discharge

Project Description

Friction Method Manning Formula
Solve For Full Flow Capacity

Input Data

Roughness Coefficient	0.010
Channel Slope	0.00500 ft/ft
Normal Depth	12.00 in
Diameter	12.00 in
Discharge	3.27 ft ³ /s

Results

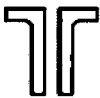
Discharge	3.27 ft ³ /s
Normal Depth	12.00 in
Flow Area	0.79 ft ²
Wetted Perimeter	3.14 ft
Hydraulic Radius	3.00 in
Top Width	0.00 ft
Critical Depth	0.77 ft
Percent Full	100.0 %
Critical Slope	0.00559 ft/ft
Velocity	4.17 ft/s
Velocity Head	0.27 ft
Specific Energy	1.27 ft
Froude Number	0.00
Maximum Discharge	3.52 ft ³ /s
Discharge Full	3.27 ft ³ /s
Slope Full	0.00500 ft/ft
Flow Type	SubCritical

GVF Input Data

Downstream Depth	0.00 in
Length	0.00 ft
Number Of Steps	0

GVF Output Data

Upstream Depth	0.00 in
Profile Description	
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.00 %



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Page 1 of 2

Worksheet for Pond Discharge

GVF Output Data

Normal Depth Over Rise	100.00	%
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	12.00	in
Critical Depth	0.77	ft
Channel Slope	0.00500	ft/ft
Critical Slope	0.00559	ft/ft



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Page 2 of 2

Cross Section for Pond Discharge

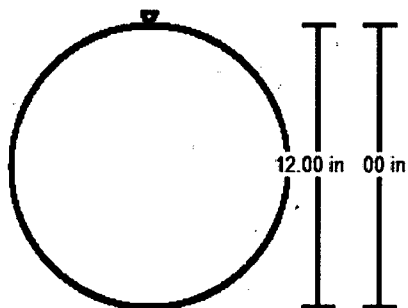
Project Description

Friction Method Manning Formula
Solve For Full Flow Capacity

Input Data

Roughness Coefficient	0.010
Channel Slope	0.00500 ft/ft
Normal Depth	12.00 in
Diameter	12.00 in
Discharge	3.27 ft ³ /s

Cross Section Image



V: 1
H: 1



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ADEQ

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Department of Environmental Quality

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