Zakrzwski, Diana <zakrzwdl@dhec.sc.gov>

Target analyte list review language for the Pinewood permit

1 message

John Wilcox <JWilcox@trinityconsultants.com> Tue, Mar 27, 2012 at 3:06 PM
To: "zakrzwdl@dhec.sc.gov" <zakrzwdl@dhec.sc.gov>
Cc: bwilliams@kestrelhorizons.com

Diana:

I have spoken with Bryan Williams of Kestrel, and he and I share the concern that the language of the addition you made to the permit appearing below:

The owner/operator shall review the target analyte list in Attachment C to determine if any HAP and/or TAP pollutants not currently required to be tested can be legitatmately tested using approved methods at each operating permit renewal.

We believe that to avoid having a third party interpret the language as requiring that the Trust make any measurements that are possible regardless of accuracy, difficulty or cost, the language either needs to be adjusted to be much more non-specific, or adjusted to be very specific. I did not have time this afternoon to prepare a very specific description, but can recommend the following less specific recommendation:

During each operating permit renewal, owner/operator shall review the target analyte list and advise the Bureau of Air if it determines that there are any HAPs or TAPs that are not already on the list for which it has identified appropriate anayltical methods that would make it feasible to add one or more of those HAPs or TAPs to the target analyte list.

Bryan has reviewed the above and has asked me to forwaard it to you. I am about to depart, returning Thursday morning. I will be somewhat reachable by phone and email.

Best Regards,

John B Wilcox, Ph.D.
Managing Consultant
Trinity Consultants, Inc.
53 Perimeter Center East, Suite 230
Atlanta, Georgia 30346
Office: 678-441-9977
Fax: 678-441-9978
Cell: 678-446-0485
jwilcox@TrinityConsultants.com

Wilcox, Ph.D._John.vcf
1K

Fw: I have not yet received a set of tank volumes for the caustic, acid and perlite tanks for the Pinewood treatment system

1 message

John Wilcox <JWilcox@trinityconsultants.com> Tue, Mar 27, 2012 at 2:17 PM
To: "zakrzwdl@dhec.sc.gov" <zakrzwdl@dhec.sc.gov>

Actual tank volumes for the insignificant tanks.

Best Regards,

John B Wilcox, Ph.D.
Managing Consultant
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jwilcox@TrinityConsultants.com

---- Forwarded by John Wilcox/Trinity Consultants on 03/27/2012 02:16 PM ----

From: "Torre, Joelle" <joelle.torre@urs.com>
To: John Wilcox <JWilcox@trinityconsultants.com>, "Turschmid, Kris" <kris.turschmid@urs.com>
Cc: "bwilliams@kestrelhorizons.com" <bwilliams@kestrelhorizons.com>
Date: 03/27/2012 02:01 PM
Subject: RE: I have not yet received a set of tank volumes for the caustic, acid and perlite tanks for the Pinewood treatment system

---

Hi John,

The maximum capacities of the tanks are as follows:

T-300 Caustic	2400 gal
T-400 Sulfuric	1300 gal
T-500 Perlite	530 gal

Joelle Torre, PE
URS Corporation
1501 4th Avenue, Suite 1400
Seattle, WA 98101-1616
Tel: 206-438-2700
Direct: 206-438-2597
Fax: 206-438-2699
E-mail: joelle.torre@urs.com

From: John Wilcox [mailto:JWilcox@trinityconsultants.com]
Sent: Tuesday, March 27, 2012 10:35 AM
To: Torre, Joelle; Turschmid, Kris
Cc: bwilliams@kestrelhorizons.com

Subject: I have not yet received a set of tank volumes for the caustic, acid and perlite tanks for the Pinewood treatment system

Kris and Joelle:

Per my email yesterday, Those need to be submitted now. Any change you can send them in the next 10 minutes?

Best Regards,

John B Wilcox, Ph.D.
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jwilcox@TrinityConsultants.com

Wilcox, Ph.D._John.vcf
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Zakrzwski, Diana <zakrzwdl@dhec.sc.gov>

Information on how the volume of leachate through the leachate tank farm at the Pinewood Site will be measured

1 message

John Wilcox <JWilcox@trinityconsultants.com> **Thu, Mar 1, 2012 at 1:39 PM**
To: "zakrzwdl@dhec.sc.gov" <zakrzwdl@dhec.sc.gov>
Cc: bwilliams@kestrelhorizons.com

Diana:

Attached is a description of how the volumes of liquids that comprise leachate produced at the Pinewood Site, and thus the volume of liquid that enters the leachate tank farm, are measured. We have agreed with the leachate treatment system designer in principal that the volume of leachate entering the evaporator will be measured by a device located just upstream of the evaporator, and that the volume of residue produced by the slurry dryer will be determined by weight. The exact details of equipment and monitoring are being worked out now.

One take-away from the volume measurement discussions should be that the methods employed each have a limit of accuracy. That, combined with the limits of accuracy inherent in the chemical analyses being employed to estimate apparent emissions, will make it essential to allow a reasonable period of time to work the bugs out of any measurement and emission estimation approach, and to understand that there will most likely be some baseline variations in the calculated results that are due simply to the sum of errors. Please let me know if you have any questions. We will provide you with further details as they become available.

Best Regards,

John B Wilcox, Ph.D.
Managing Consultant
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Fax: 678-441-9978
Cell: 678-446-0485
jwilcox@TrinityConsultants.com

2 attachments

Wilcox, Ph.D._John.vcf
1K

Discussion of measurement of volume to the Pinewood Site LTF (2012-03-01).pdf
10K

Measurement of Leachate Volume through the Leachate Tank Farm at the Pinewood Site

The liquid that is accumulated on the Pinewood Site (the Site) in the leachate tank farm is a combination of liquids from several on-Site sources. The volume of such leachate generated at the Site is currently being quantified by the following two independent means:

1) Measurement of volumes pumped from different sources; and

2) Measurement of the volume shipped off-Site for treatment.

The primary means of measuring the volume of leachate generated at the Site is using pumped volumes. A Distributed Control System (DCS) automatically records leachate volumes generated at each primary sump in the landfill sections based on monitoring the number of strokes that have been made by the positive displacement pump located in each sump. The leachate volume produced by each primary sump over a given period of time is estimated by using a factor to convert strokes made by the sump pump over that period of time into volume. Manual pumping and recording of the primary sump volumes is also performed as needed due to pump failures and line clogging.

The volume of leachate produced by the secondary sumps in the landfill sections is recorded manually at flow meters positioned at each sump head when the contents of those sumps are pumped into a truck mounted tank. In addition, rainwater is collected at the Site by vacuum truck from containment sumps in the two tank farm buildings and various valve and flow meter boxes. Rinse waters from equipment, tank and sump cleaning, and water generated from leachate line clean-outs, repairs, and pressure testing are also collected. Collection from those sources is via a vacuum truck, and the volume collected is determined by weight.

Volumes of liquids produced from each of the collection and measurement activities described above are summed regularly to arrive at the total volume of leachate produced (and thus entering the leachate tank farm) during a given period of time.

A secondary means of measuring the volume of leachate produced by the landfill is by weighing, both before and after they are loaded, the leachate tank trucks that are used to transport leachate to the offsite treatment facility. This measurement will no longer be made when regular off-site shipment of leachate for disposal ceases in the near future.

Using the data described above, the Site has compared pumped totals to shipped totals. Such comparisons have shown that volumes measured by pumping have at times exceeded volumes measured by weighing the quantity shipped offsite by approximately 12.5%. The quantitative discrepancies are likely due to variances in calculating positive displacement pump volumes (volume/stroke) due to pump fouling and seal wear; extended pump cycling due to level monitoring (bubbler) fouling; and tank level sensory errors.

The Trust plans to continue to measure the volume of leachate produced by the landfill (and thus entering the leachate tank farm) using the pumped volume method described above. This will become the sole means of volume measurement when leachate is no longer being routinely shipped offsite for treatment. The Trust intends in install in the Leachate Treatment System (LTS) being constructed on-Site a separate means of measuring the volume of leachate that enters the evaporator, and the volume of residue that is

produced by the slurry dryer. The exact means to be used to make those measurements is currently under consideration.

Zakrzwski, Diana <zakrzwdl@dhec.sc.gov>

List of target analytes for estimating leachate treatment system emissions

1 message

John Wilcox <JWilcox@trinityconsultants.com> **Mon, Feb 27, 2012 at 7:51 AM**
To: "zakrzwdl@dhec.sc.gov" <zakrzwdl@dhec.sc.gov>
Cc: bwilliams@kestrelhorizons.com

Diana:

Pursuant to our discussions last week, I have prepared and attached a table of target analytes that are the hazardous air pollutants (HAPs) and Standard No. 8 toxic air pollutants (TAPs) that were included in the estimate of potential emissions from the leachate treatment system in the recent air permit application for the Pinewood Site.

Phosphorus was deleted from the attached list because inspection of the Standard 8 TAP list showed that it included phosphorus and various compounds of phosphorus. This indicated that the chemical form of phosphorus included on the Standard No. 8 list as CAS 7723-14-0 was elemental. The methods used to analyze the leachate samples for phosphorus, EPA SW846 methods 3005A/6010 cannot distinguish between elemental phosphorus and phosphorus contained in compounds. Because elemental phosphorus is reactive, it is essentially impossible for it to exist in an elemental form in the leachate. Therefore, it was removed from the list.

Best Regards,

John B Wilcox, Ph.D.
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Office: 678-441-9977
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Cell: 678-446-0485
jwilcox@TrinityConsultants.com

2 attachments

Wilcox, Ph.D._John.vcf
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Target Analytes for Leachate Treatment System Pinewood Site (2012-02-27).xlsx
41K

Chemical Name	CAS No.
Methanol	67-56-1
Methylene chloride	75-09-2
Ethylene glycol	107-21-1
2-Butanone	78-93-3
1,1,1-Trichloroethane	71-55-6
Trichloroethylene	79-01-6
1,4-Dioxane	123-91-1
Triethylene glycol	112-27-6
Chloroform	67-66-3
1,1-Dichloroethane	75-34-3
Toluene	108-88-3
1,2-Dichloroethane	107-06-2
Carbon disulfide	75-15-0
Arsenic	7440-38-2
Phenol	108-95-2
4-Methyl-2-pentanone	108-10-1
Tetrachloroethylene	127-18-4
m,p-Cresols	65794-96-9
Acetonitrile	75-05-8
1,1,2-Trichloroethane	79-00-5
bis(2-Ethylhexyl)phthalate	117-81-7
Nickel	7440-02-0
Benzene	71-43-2
1,4-Dichlorobenzene	106-46-7
Styrene	100-42-5
o-Cresol	95-48-7
Xylenes (total)	1330-20-7
Aniline	62-53-3
1,1-Dichloroethylene	75-35-4
2,4-Dinitrophenol	51-28-5
Cadmium	7440-43-9
1,2,4-Trichlorobenzene	120-82-1
m,p-Xylenes	
Cobalt	7440-48-4
Chlordane (tech.)	57-74-9
o-Xylene	95-47-6
Isophorone	78-59-1
Chromium	7440-47-3
Pentachlorophenol	87-86-5
Chlorobenzene	108-90-7
Ethylbenzene	100-41-4
Phenanthrene	85-01-8
Acetophenone	98-86-2
Diethylphthalate	84-66-2
Dimethylphthalate	131-11-3
1,1,2,2-Tetrachloroethane	79-34-5
Caprolactam	105-60-2
bis(2-Chloroethyl) ether	111-44-4
Naphthalene	91-20-3

Chemical Name	CAS No.
Lead	7439-92-1
Acenaphthene	83-32-9
Chloroethane	75-00-3
2-Methylnaphthalene	91-57-6
Heptachlor	76-44-8
Hexachlorocyclopentadiene	77-47-4
Fluoranthene	206-44-0
Selenium	7782-49-2
Toxaphene	8001-35-2
Hexachlorobenzene	118-74-1
Pyrene	129-00-0
Di-n-octylphthalate	117-84-0
Fluorene	86-73-7
Cyanide, Total	57-12-5
Vinyl chloride	75-01-4
Carbon tetrachloride	56-23-5
1-Methylnaphthalene	90-12-0
1,2-Dibromoethane	106-93-4
o-Toluidine	95-53-4
Dibenzofuran	132-64-9
1,2-Dibromo-3-chloropropane	96-12-8
Benzo(a)anthracene	56-55-3
1,2-Diphenylhydrazine	122-66-7
2,4-D	94-75-7
Anthracene	120-12-7
Di-n-butylphthalate	84-74-2
Chrysene	218-01-9
Antimony	7440-36-0
1,2-Dichloropropane	78-87-5
2-Chloronaphthalene	91-58-7
4,4'-DDE	72-55-9
Vinyl acetate	108-05-4
Bromoform	75-25-2
Aroclor-1221	11104-28-2
Benzo(b)fluoranthene	205-99-2
Acrylonitrile	107-13-1
1-Naphthylamine	134-32-7
Hexachlorobutadiene	87-68-3
2,4,5-Trichlorophenol	95-95-4
Benzo(a)pyrene	50-32-8
Benzo(k)fluoranthene	207-08-9
Chloromethane	74-87-3
Benzo(ghi)perylene	191-24-2
Indeno(1,2,3-cd)pyrene	193-39-5
Methoxychlor	72-43-5
Mercury	7439-97-6
gamma-BHC (Lindane)	58-89-9
1,3-Dichloropropylene(total)	542-75-6
2,4,6-Trichlorophenol	88-06-2

Chemical Name	CAS No.
2,4-Dinitrotoluene	121-14-2
2-Acetylaminofluorene	53-96-3
2-Chloro-1,3-butadiene	126-99-8
2-Methyl-4,6-dinitrophenol	534-52-1
2-Naphthylamine	91-59-8
2-Nitropropane	79-46-9
3,3'-Dichlorobenzidine	91-94-1
3,3'-Dimethylbenzidine	119-93-7
3-Methylcholanthrene	56-49-5
4,4'-Methylenebis(2-chloroaniline)	101-14-4
4-Aminobiphenyl	92-67-1
4-Nitrophenol	100-02-7
Acenaphthylene	208-96-8
Acrolein	107-02-8
Allyl chloride	107-05-1
Aroclor-1016	12674-11-2
Aroclor-1232	11141-16-5
Aroclor-1242	53469-21-9
Aroclor-1248	12672-29-6
Aroclor-1254	11097-69-1
Aroclor-1260	11096-82-5
Aroclor-Total	
Benzidine	92-87-5
Benzyl chloride	100-44-7
Beryllium	7440-41-7
Biphenyl	92-52-4
Bromomethane	74-83-9
Chloroacetic acid	79-11-8
Chlorobenzilate	510-15-6
Dibenzo(a,e)pyrene	192-65-4
Formaldehyde	50-00-0
Hexachloroethane	67-72-1
Hexane	110-54-3
Hydrazine	302-01-2
Iodomethane	74-88-4
Isopropylbenzene	98-82-8
Kepone	143-50-0
m-Dinitrobenzene	99-65-0
Methyl methacrylate	80-62-6
Mirex	2385-85-5
Nitrobenzene	98-95-3
Nitroglycerin	55-63-0
N-Methyl-N-nitrosomethylamine	62-75-9
N-Nitrosomorpholine	59-89-2
p-(Dimethylamino)azobenzene	60-11-7
Parathion	56-38-2
p-Benzoquinone	106-51-4
Pentachloronitrobenzene	82-68-8
p-Nitroaniline	100-01-6

Target Analytes Used in Leachate Treatment System Emission Estimates Pinewood Site (Continued)

Chemical Name	CAS No.
p-Nitrotoluene	99-99-0
p-Phenylenediamine	106-50-3
tert-Butyl methyl ether	1634-04-4

JW (2012-02-27): Phosphorus was deleted from the list because inspection of the Standard 8 TAP list showed that various compounds of phosphorus. This indicated that the phosphorous on the list was elemental phosphorus. Th sample, 3005A/6010 cannot distinguish between elemental phosphorus and phosphorus contained in compounds. is reactive, it is not likely that phosphorus would exist in an elemental form in the leachate.

it included phospphorus and
e method used to analyze the
Because elemental phosphorus

Zakrzwski, Diana <zakrzwdl@dhec.sc.gov>

Revised electronic application and cover letter for the Pinewood Site

1 message

John Wilcox <JWilcox@trinityconsultants.com> **Fri, Feb 24, 2012 at 1:29 PM**
To: "zakrzwdl@dhec.sc.gov" <zakrzwdl@dhec.sc.gov>
Cc: bwilliams@kestrelhorizons.com

Diana:

Attached please find a complete application for the leachate treatment system for the Pinewood Site leachate treatment system that has been revised to include changes we have discussed. Please let me know if you have any questions or comments about the revised application.

Best Regards,

John B Wilcox, Ph.D.
Managing Consultant
Trinity Consultants, Inc.
53 Perimeter Center East, Suite 230
Atlanta, Georgia 30346
Office: 678-441-9977
Fax: 678-441-9978
Cell: 678-446-0485
jwilcox@TrinityConsultants.com

3 attachments

Wilcox, Ph.D._John.vcf
1K

L01 Cover Letter to DHEC for Revised Application FINAL (2012 02 24).pdf
167K

Pinewood Site Leachate Treatment System Application Report FINAL(2012-02-24).pdf
2378K

53 Perimeter Center East | Suite 230 | Atlanta, GA 30346 | P (678) 441-9977 | F (678) 441-9978
trinityconsultants.com

Trinity Consultants

VIA E-MAIL:

February 24, 2012

Diana Zakrzwski
Permitting Section
S.C. DHEC – Bureau of Air Quality
2600 Bull Street
Columbia, SC 29201

RE: Revised Leachate Treatment System Application for the Pinewood Site

Ms. Zakrzwski:

Pursuant to your request, the Pinewood Site Custodial Trust is submitting an electronic version of the construction permit application for the leachate treatment system to be constructed at the Pinewood Site that includes the updated tables and minor corrections that we have previously discussed with you. Specifically, the following revisions have been made to the application report and appendices:

- Table 3-1 in the application report was revised to show the 0.01 ton per year decreases in site wide VOC and HAP emissions.
- Section 4.5.6.1 of the report was renumbered to 4.5.7, and the following sections renumbered accordingly.
- Section 4.5.9 of the report was revised to include language regarding control of fugitive dust emissions that had been inadvertently omitted from the original report. It became Section 4.5.10 in the revised report due to the renumbering described above.
- Table D-1 in Appendix D has been revised to show the most recent VOC emission rates. The total rates decreased by 0.01 lb/day and 0.01 tons per year.
- Table D-2 in Appendix D has been revised to show the corrected estimated pounds per day potential emission rates for the sumps in Section II (S2).
- Table E-1 in Appendix E has been revised to reflect any changes associated with the corrections to Table D-2.
- Form Part I in Appendix F was revised to show the minor changes in emissions in Table D-1
- Form Part IIB for LTS1 in Appendix F was revised to include VOC emissions in Section 7, which had been inadvertently omitted from the original form.
- Forms Part IIG for T-300, T-400 and T-500 in Appendix F were revised to delete the yellow highlighting from entries in Section 3b.
- Various typographical errors and Adobe PDF error messages were corrected in the text of the report.

Please feel free to contact me at (678) 441-9977 or Mr. Bryan Williams of Kestrel Horizons, LLC at (843) 266-8511 with any questions or comments.

Sincerely,

TRINITY CONSULTANTS

John B. Wilcox, Ph.D.
Managing Consultant

Attachments

cc: Bryan Williams, Kestrel Horizons LLC (Charleston, SC)

D H E C

Zakrzwski, Diana <zakrzwdl@dhec.sc.gov>

Estimated quantity of liquid evaporated in the sludge dryer of the Pinewood Site Leachate Treatment System

1 message

John Wilcox <JWilcox@trinityconsultants.com> **Thu, Feb 16, 2012 at 4:46 PM**
To: "zakrzwdl@dhec.sc.gov" <zakrzwdl@dhec.sc.gov>
Cc: bwilliams@kestrelhorizons.com

Diana:

I am sending this email in response to your request for information during our phone call of February 13 about the quantity of liquid evaporated from the sludge dryer in the proposed leachate treatment system (LTS) at the Pinewood Site. The purpose of sludge dryer is to reduce the liquid content of the filter cake that will be produced in the plate and frame filter that is part of the LTS.

I used data from an equipment sizing memo that was provided by the engineering firm that is designing the LTS to estimate the quantity of water (assumed to be tank farm leachate) that would be evaporated from the sludge dryer during any typical 24 hour period of operation of the dryer. That memo listed the daily throughput of the filter press as 6,475 gallons, the solids content of the dried sludge as 30%, and the weight of solids after drying as 162.1 lb. Using those numbers I estimated that the total daily mass of wet sludge would be 162.1/0.3, or 540.3 lb. Subtracting the solids, that leaves 378.2 lb water, which corresponds to 378.2/8.34 or 45.4 gallons of water. Therefore, the estimated daily quantity of water evaporated from the sludge divided by the total daily leachate throughput of the LTS is 45.4/6,475 or 0.007. This estimate was checked by an engineer at the firm designing the LTS and found to be reasonable.

I think it would be conservative to assume that the potential daily emissions of leachate chemicals from the sludge dryer would be approximately 0.7% of the estimated total estimated potential daily emissions of leachate chemicals that we had included in Table D-2 of the air quality construction permit application for the leachate treatment system. That is less than approximately 280 pounds of HAP per year, assuming that all HAP in the sludge evaporates in the dryer(which is unlikely). Note that the sludge dryer only needs to operate for a limited number of hours per week.

Please let me know if you need any further information.

Best Regards,

John B Wilcox, Ph.D.
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Trinity Consultants, Inc.
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Cell: 678-446-0485
jwilcox@TrinityConsultants.com

D H E C

Zakrzwski, Diana <zakrzwdl@dhec.sc.gov>

Corrected Table D-2 for the Pinewood Site construction permit application

1 message

John Wilcox <JWilcox@trinityconsultants.com> **Tue, Feb 14, 2012 at 9:52 AM**
To: zakrzwdl@dhec.sc.gov
Cc: bwilliams@kestrelhorizons.com, Justin Fickas <JFickas@trinityconsultants.com>, Courtney Brown <CBrown@trinityconsultants.com>, Judy Collora <jcollora@trinityconsultants.com>

Diana:

I corrected the error in Table D-2 that we discussed this morning. The pound per day values listed in Table D-2 for Section II (S2) were in fact pound per hour values. The ton per year values listed for S2 were correct, so the Site-wide HAP and VOC PTE remain unchanged after the correction. A revised Table D-2 containing the corrected values is in the attached Excel workbook.

I also checked to see if the correction affected the modeling results. Although the corrections slightly increased the Site-wide pound per day estimated emission rates for some compounds, the increase was not sufficient to cause the pound per day emission rates of any additional TAPs to be greater than or equal to their Standard No. 8 de minimis levels. Therefore, the correct TAPs were modeled. I have included in the attached spreadsheet a corrected version of Table E-1 in which the comparisons of daily TAP emission rates to their de minimis levels are made.

The sump emission rates, in grams per second, that were used in modeling were not calculated from the values in Table D-2, but instead came directly in grams per second from the WATER9 tables. Therefore, the correct TAP emission rates were modeled.

Insofar as I can tell, the error in Table D-2 should have no effect on the application, other than the presence of erroneous values which have been corrected in the attached workbook. I have also attached pdf versions of the corrected tables, which can be printed and inserted into the permit application, if desired. Please let me know if there is anyone else we need to communicate with or anything else we need to do regarding this correction.

Best Regards,

John B Wilcox, Ph.D.
Managing Consultant
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53 Perimeter Center East, Suite 230
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Cell: 678-446-0485
jwilcox@TrinityConsultants.com

4 attachments

Wilcox, Ph.D._John.vcf
1K

Table D-2 Pinewood Site CORRECTED (2012-02-14).pdf
98K

Table E-1 Pinewood Site CORRECTED (2012-02-14).pdf
44K

Corrected Tables D-2 and E-1 Pinewood Site (2012-02-14).xlsx
119K