

*2014 Progress Report  
Former Amoco Terminal  
2904 Winter Street, Superior, Wisconsin  
Antea Group Project No. WISUPER141*



## ***Appendix L***

LNAPL Volumes



Amoco Corporation  
 7201 E. 38th Street, #7253  
 Tulsa, Oklahoma 74145-3207

Post Office Box 3385  
 Tulsa, Oklahoma 74102-3385

Environment, Health & Safety Department  
 Groundwater Management Services  
 Telephone: (918) 660-4420  
 Facsimile: (918) 660-4443

May 26, 1995

Rebecca Kulas  
 Amoco Corporation  
 P. O. Box 59187  
 Minneapolis, MN 55459

Ed Heytens  
 Amoco Oil Company  
 2904 Winter Street  
 Superior, WI

Dan Sanville  
 Delta Environmental  
 3900 N Woods Dr., Suite 200  
 St. Paul, MN 55112

**Liquid Hydrocarbon Characterization**  
**Superior Terminal, Superior, Wisconsin**

Amoco Corporation Groundwater Management Services (GMS) received 15 liquid hydrocarbon samples from the subject site. A sixteenth sample (RW-3) was listed on the chain-of-custody, but was not found in the shipment. The 15 samples were analyzed by Tulsa Analytical Services for hydrocarbon identification by capillary column gas chromatography and/or lead content by atomic absorption.

The chromatograms of the samples tended to fall into three categories. These were:

- A) Naphtha or low grade gasoline, relatively undegraded (Figure 1).
- B) A bimodal mixture dominated by midgrade to possibly premium gasoline (C5 to C10) with a subordinate amount of diesel fuel or No. 2 fuel oil (C11 to C20, with peaks centered near C15). The gasoline range product looks more midgrade than premium. MCH is present but subordinate to toluene and trimethylbenzenes. Gasoline range product is relatively undegraded. Diesel/Fuel oil range product appears weathered. (Figure 2)
- C) A nearly equal bimodal mixture, slightly dominated by kerosene range product (C11 to C18, with peaks centered near C13), and somewhat subordinate naphtha range product. The naphtha range product is probably not gasoline because of the high MCH content and relatively high amounts of straight chain hydrocarbons in conjunction with relatively low amounts of aromatics and 2,2,4-trimethylpentane. The naphtha range product appears relatively undegraded.

Well ID/Sample No.	Lead Content (grams/gallon)	Product Category (as described above)
MW 1	0.64	B
MW 2	1.18	A
MW 14	0.17	C
MW 22	0.15	C
MW 23	0.65	B
MW 24	1.09	A
MW 25	0.72	B
MW 26	0.50	<del>B</del> C
MW 27	0.05	C
MW 32	0.05	C
RW 1	0.24	C
RW 2	0.52	B
RW 3	sample not received	
RW 4	0.61	C
RW 5	0.28	B
RW 6	1.24	A

MW 16

0.96

C

(collected Aug. '95)

Please contact GMS at 918-660-4130 if you have questions regarding these data.



Lyle G. Bruce, Ph.D. CPG  
Senior Hydrogeologist



T. J. Nagengast  
Senior Environmental Specialist

TJN/LGB/cib  
95168.doc

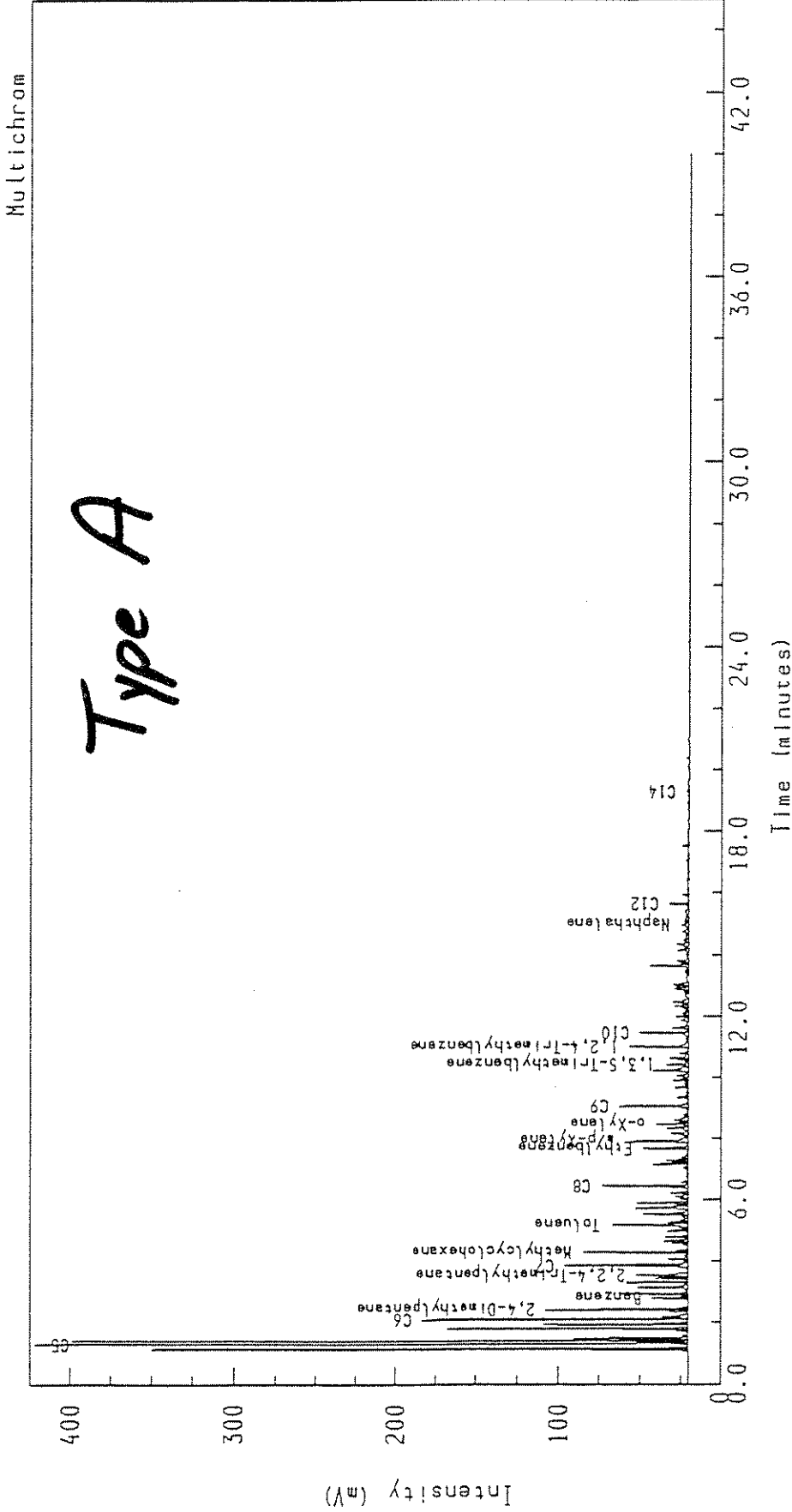
Attachment

E. L. Hockman - Tulsa

Tulsa Analytical Services' Vax Multichrom



Analysis Name : [PRODUCT] 13 042195A,4,1.  
95H0076, Superior Terminal, WI Amount : 1.000



Type A

Figure 1

Instrument : HP5890  
Channel Title : Channel #13  
Lims ID : MW-2  
Acquired on 21-APR-1995 at 18:35  
Reported on 23-APR-1995 at 07:50

Method : PRODUCT  
Calibration : PRODUCT  
Run Sequence : PRODUCT  
Lead Content : 1.18  
Arms/rollin  
LDN # 11446 page 74  
WDA

Analysis Name : [PRODUCT] 13 042195A,3,1.  
95H0075, Superior Terminal, WI Amount : 1.000

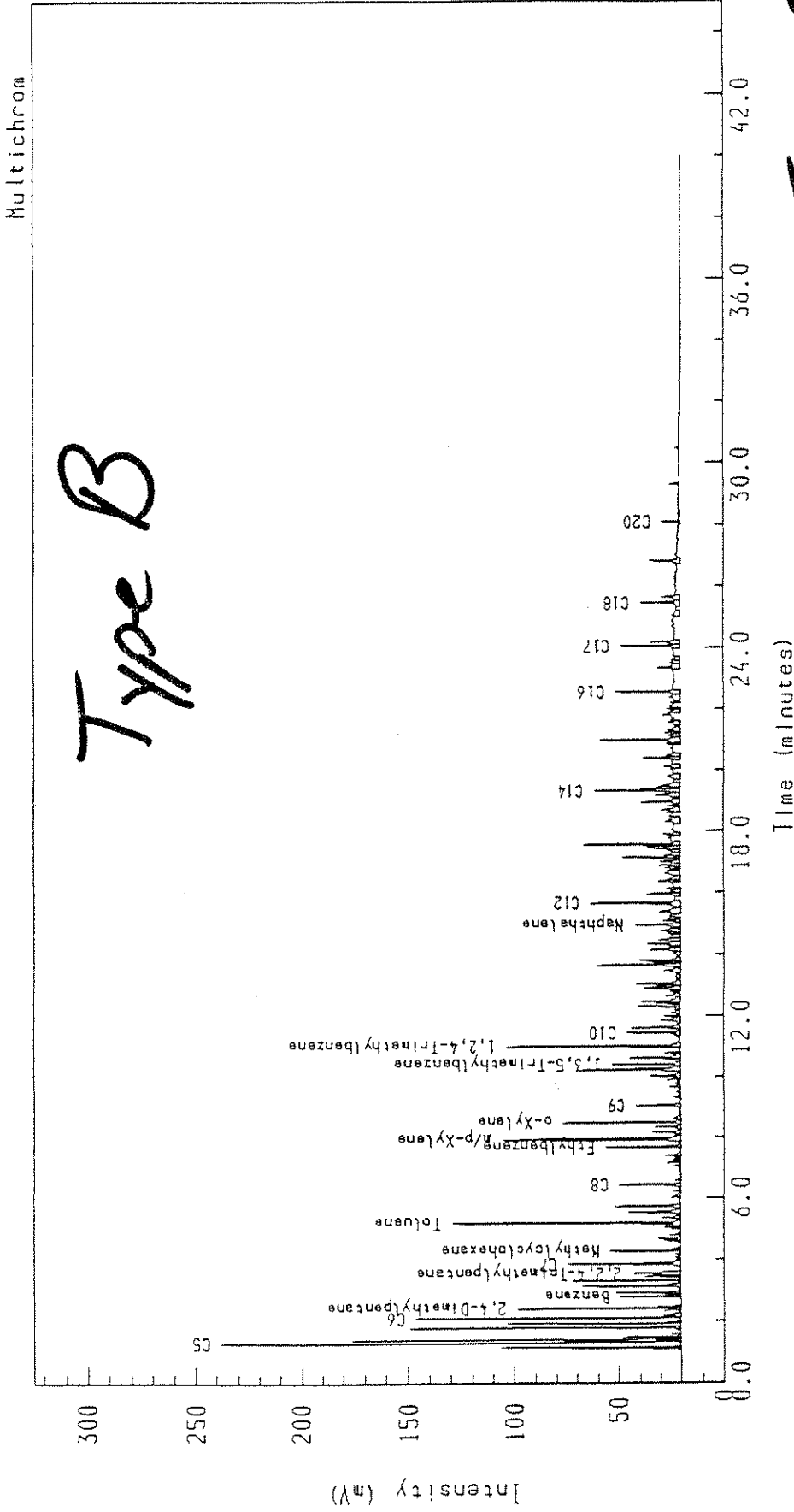


Figure 2

Instrument : HP5890 Method : PRODUCT  
 Channel Title : Channel #13 Calibration : PRODUCT  
 Lims ID : MW-1 Run Sequence : PRODUCT  
 Acquired on 21-APR-1995 at 17:42  
 Reported on 23-APR-1995 at 07:40

Lead Contain: 0.64 Hg  
 LDN# 11411 9546 ppm/s/coll:n  
 HLR Bad  
 DRB  
 74



Tulsa Analytical Services' Vax Multichrom

Analysis Name : [PRODUCT] 13 042195A, 5, 1.

95H0077, Superior Terminal, WI Amount : 1.000

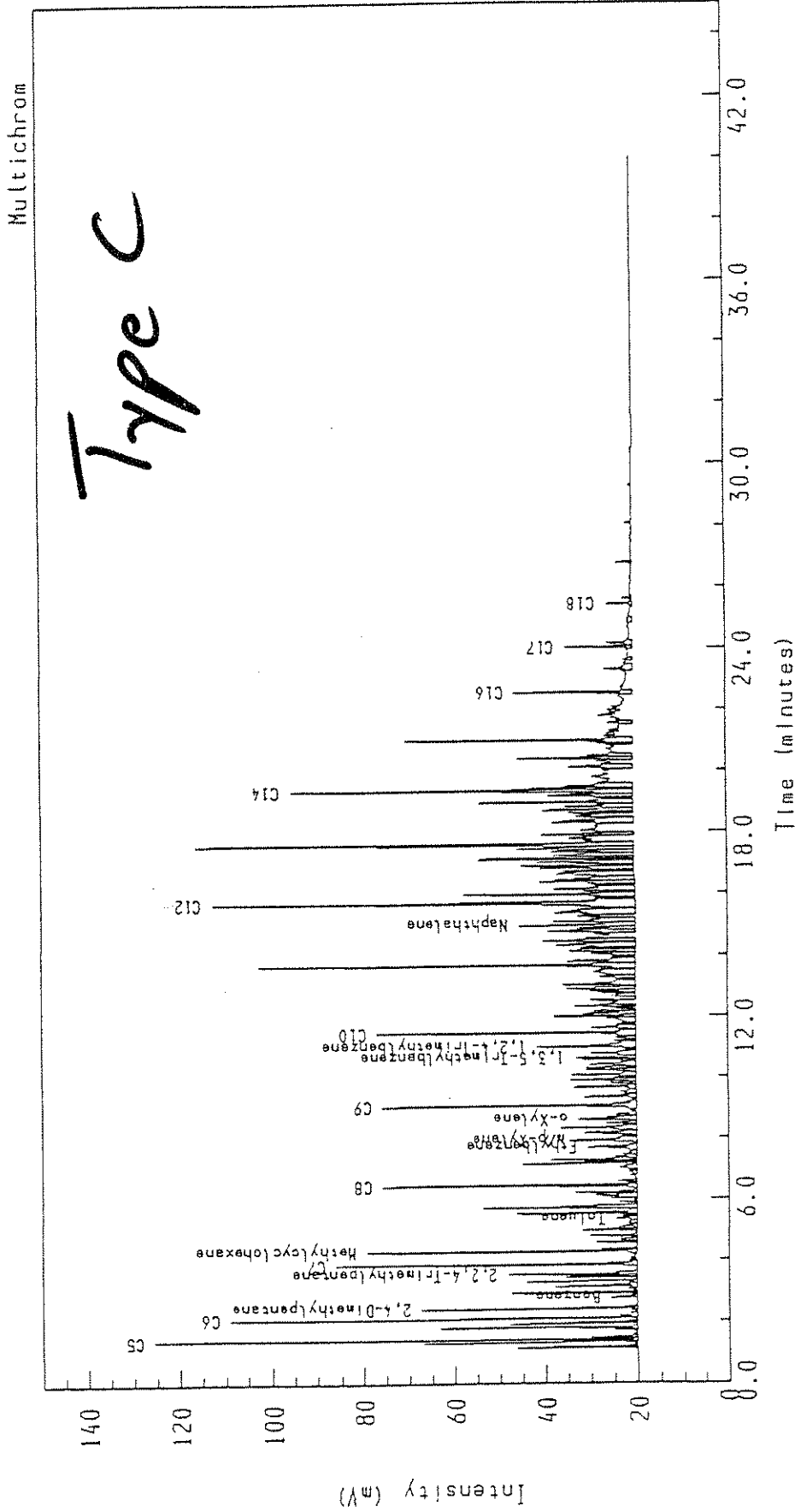


Figure 3

Instrument : HP5890 Method : PRODUCT  
 Channel Title : Channel #13 Calibration : PRODUCT  
 Lims ID : MW-14 Run Sequence : PRODUCT

Acquired on 21-APR-1995 at 19:28  
 Reported on 23-APR-1995 at 07:57

Lead Content: 0.17 grams/gallon  
 LDO# 11446 page 74  
 RMAI



# Amoco Corporation Tulsa Analytical Services Sample Transmittal Form

<p><b>*Amoco Representative Authorizing Work:</b></p> <p><u>Rebecca Kulas</u></p> <p><input type="checkbox"/></p> <p>Amoco Person Who Contacted You*</p> <p><u>29320</u></p> <p>Amoco Internal Billing Number* <u>PRJW #</u></p>	<p><b>*Sector Affiliation: (Check one)</b></p> <p><input checked="" type="checkbox"/> Shared Services (SS)</p> <p><input type="checkbox"/> Petroleum Products (PP)</p> <p><input type="checkbox"/> Chemical (C)</p> <p><input type="checkbox"/> Exploration and Production (E&amp;P)</p> <p><u>EHS</u></p> <p>Business Group*</p>
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**\*Note: Laboratory Results will not be mailed out unless this section is completed.**

<p><b>*Facility/Service Station Information</b></p> <p><u>Superior Terminal</u></p> <p>Facility Name</p> <p><u>WA</u></p> <p>Service Station Number</p> <p><u>2904 Winter Street</u></p> <p>Street Address</p> <p><u>Superior, W.E</u></p> <p>City, State, Zip</p>	<p><b>*Consultant Information</b></p> <p><u>Dan Fenville</u></p> <p>Name of Consulting Company Project Manager</p> <p><u>Delk Environmental</u></p> <p>Name of Consulting Company</p> <p><u>3900 N. Woods Drive, Suite 200</u></p> <p>Street Address/Suite Number</p> <p><u>Superior, W.E</u></p> <p>City, State, Zip</p> <p><u>612-486-8022</u></p> <p>Telephone Number</p> <p><u>612-486-5827</u></p> <p>Telephone Number</p> <p><u>612-986-8022</u></p> <p>FAX Number</p>
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<p><b>Analyses Requested:</b> (Check Appropriate Box or Boxes)</p> <p><b>Groundwater</b></p> <p><input type="checkbox"/> BTEX</p> <p><input type="checkbox"/> MTBE</p> <p><input type="checkbox"/> PHC</p> <p><input type="checkbox"/> Naphthalene</p> <p><b>Product</b></p> <p><input checked="" type="checkbox"/> Product Characterization</p> <p><input checked="" type="checkbox"/> Lead Content</p>	<p><b>Date Results Required:</b></p> <p><u>May 1, 1995</u></p> <p>---</p> <p>(Results can be faxed if the FAX number is provided.)</p> <p><b>Send Results to:</b></p> <p><input checked="" type="checkbox"/> Amoco Representative</p> <p><input checked="" type="checkbox"/> Consultant</p> <p><input checked="" type="checkbox"/> Other</p> <p>(Provide Information Below)</p> <p><u>Ed Keytons Amoco-Dyers</u></p> <p><u>Tim N. Jorgensen - Amoco - Tulsa</u></p>	<p><b>Send Samples to:</b></p> <p>Amoco Corporation Tulsa Analytical Services J-Dock, Building 1 4502 East 41st Street Tulsa, OK 74135</p> <p>Telephone Number: (918) 660-4180</p> <p>FAX Number: (918) 660-4188</p> <p>Amoco SOCON 8 - 422-4180</p>
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Reason for Sampling or Additional Remarks: Product ID

Shipped by: OZ Date: 4/13/95 Received By: \_\_\_\_\_ Date: \_\_\_\_\_

Please Attach Original "Chain of Custody" Form or Complete Form on Reverse Side.



# Tulsa Analytical Services Chain of Custody Record

Page 1 of 1 Pages

Location Sampled:

Facility Name: Snyder, WI Address: 1111 W. M. 1111

Street Address: Snyder, WI  
(Please Print Name)

City, State: Snyder, WI Service Station Number: 1111

Sampler: 1111  
(Use AMOCO Facility Number When Known)

Sampler Signature:

TAS Use Only

Sample Identification

Sample Identification	Date Sampled	Time Sampled	Sample Type W - Water P - Product	Preservation Method (Green, Ice Packs, None)	Sample Container Description	Number of Containers	Analyses Required					
							Water Sample	Product Sample	GC Scan	Lead		
							BIEX	MTBE	PHC	NAP		
MW-1	4/19/95	14:31	P	N <sub>2</sub> N	40ml	2					X	X
MW-2	4/19/95	14:25	P	N <sub>2</sub> N	40ml	2					X	X
MW-14	4/19/95	14:41	P	N <sub>2</sub> N	40ml	2					X	X
<del>MW-14</del> MW-32	4/19/95	15:05	P	N <sub>2</sub> N	40ml	2					X	X
MW-22	4/19/95	17:28	P	N <sub>2</sub> N	40ml	2					X	X
MW-23	4/19/95	14:22	P	N <sub>2</sub> N	40ml	2					X	X
MW-24	4/19/95	14:33	P	N <sub>2</sub> N	40ml	2					X	X
MW-25	4/19/95	14:38	P	N <sub>2</sub> N	40ml	2					X	X
MW-26	4/19/95	15:20	P	N <sub>2</sub> N	40ml	2					X	X
MW-27	4/19/95	14:47	P	N <sub>2</sub> N	40ml	2					X	X
RW-1	4/19/95	14:43	P	N <sub>2</sub> N	40ml	2					X	X
RW-2	4/19/95	14:43	P	N <sub>2</sub> N	40ml	2					X	X
RW-3 (missing)	4/19/95	14:40	P	N <sub>2</sub> N	40ml	2					X	X
RW-4	4/19/95	14:57	P	N <sub>2</sub> N	40ml	2					X	X
RW-5	4/19/95	14:28	P	N <sub>2</sub> N	40ml	2					X	X
RW-6	4/19/95	14:24	P	N <sub>2</sub> N	40ml	2					X	X

Comments:

1. Relinquished By: Pen Crosby

1. Date: 4/13/95

2. Received By: Pen Crosby

2. Date: 4/18/95

3. Relinquished By: Sherry Colbert

3. Date: 4/24/95

3. Received By: Sherry Colbert

3. Date: 5/26/95

2. Relinquished By: Sherry Colbert

2. Date: 5/26/95

4. Relinquished By: Sherry Colbert

4. Date: 5/26/95

4. Relinquished By: Sherry Colbert

4. Date: 5/26/95

4. Received By: Sherry Colbert

4. Date: 5/26/95



**Tulsa Analytical Services**

**Amoco Corporation**

4502 E. 41st St., P.O. Box 3385, Tulsa, OK 74102 Phone: (918) 660-4180 Fax: (918) 660-4188

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**DATE:** April 24, 1995

**TO:** Dan Sanville  
Delta Environmental  
3900 N. Woods Drive  
Suite 200  
St. Paul, MN 55112

**CC:** Rebecca Kulas - CHILAGO  
Amoco Remediation ZRAKDE  
CTSUMB

**SUBJECT:** Product samples Amoco Terminal  
Superior, WI  
TAS Lab# 95H0075 to 95H0089  
Received on April 18, 1995

PETROLEUM  
PRODUCTS  
SECTOR  
NO FROHE#

The analyses requested have been completed by the TAS Laboratory. The results and original Chain of Custody have been forwarded to Groundwater Management Services for interpretation. Any further questions concerning these samples should be directed to Charlotte Bell, GMS (918-660-4166) (Fax# 918-660-4160).

Dave Hild  
Analytical Technologist  
TAS Laboratory

Gary Lewis  
will resample PW-3 in Early May

LAB #: 9511008

# COMMENTS LOG

Tulsa Analytical Services  
Amoco Corporation

## SAMPLE RECEIPT

Date	Comments	Initials
<u>4-18-95</u>	<u>Samples received in following condition:</u>	<u>DJL</u>
	<u>Temperature upon receipt</u>	
	<u>Samples transferred to refrigerator #</u>	

## LOG-IN

Date	Comments	Initials
<u>4-18-95</u>	<u>All paperwork complete.</u>	<u>DJC</u>
	<u>Following paperwork incomplete:</u>	
<u>4-21-95</u>	<u>Talked to Don Samillo (612)-486-5827 @ Delta</u>	<u>DJL</u>
	<u>concerning missing sample.</u>	
<u>4-18-95</u>	<u>Samples logged into database.</u>	<u>DJC</u>
	<u>Sample exception form sent to Amoco rep and consultant.</u>	

## EXTRACTION

Date	Comments	Initials
	<u>Freon transferred to vials; vials to refrigerator #</u>	

## ANALYSIS

Date	Comments	Initials
<u>4-21-95</u>	<u>GC# Prod Channel # 13</u>	<u>DJL</u>
	<u>Following samples diluted by 20X:</u>	
<u>4-24-95</u>	<u>Loads on AA, LON# 11446 page 74</u>	<u>DJL</u>
	<u>PHC's processed</u>	

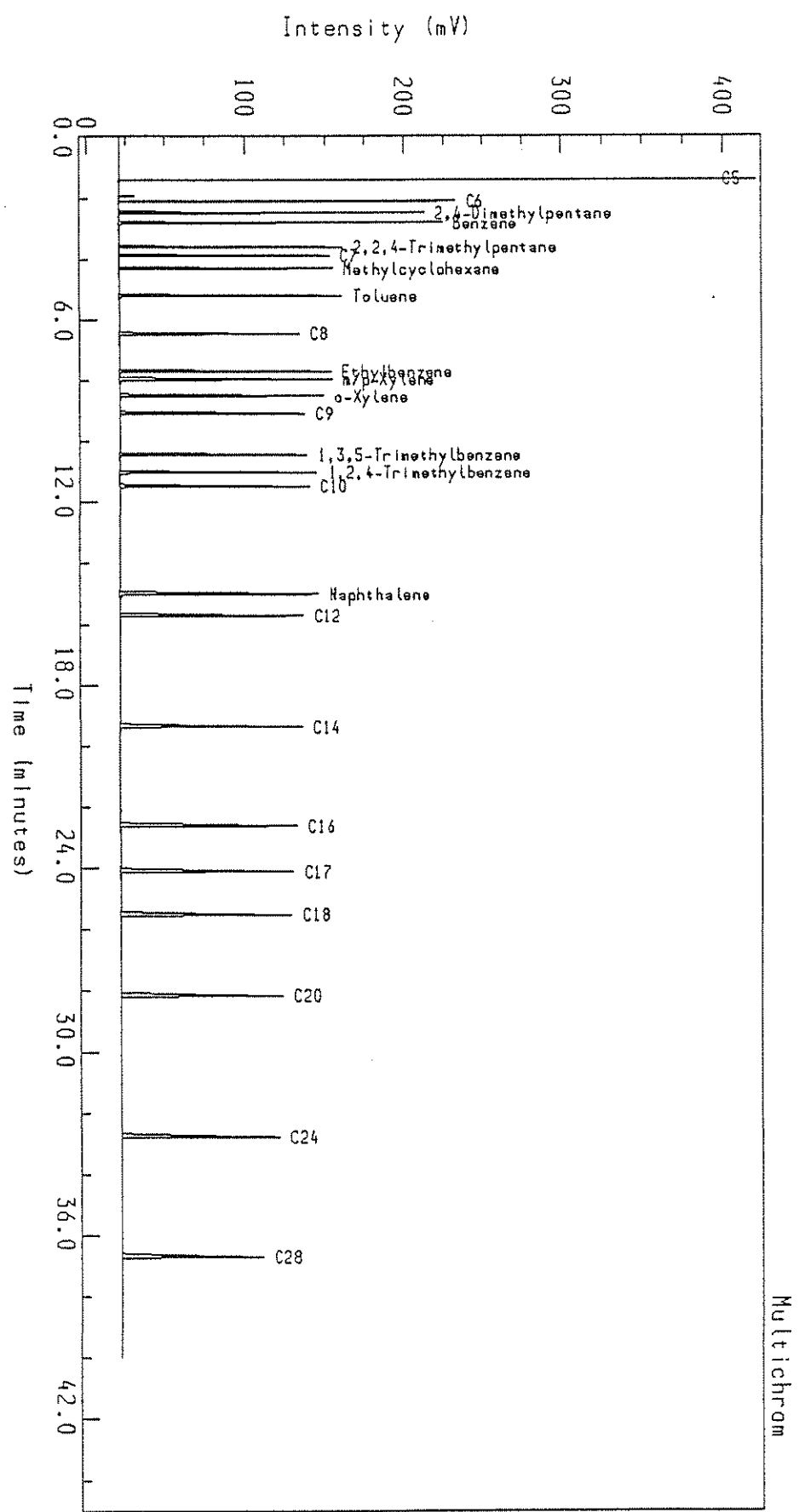
## RESULTS

Date	Comments	Initials
<u>4-24-95</u>	<u>Data reviewed and released</u>	<u>DJL</u>
	<u>Analytical results faxed</u>	
	<u>Final report mailed</u>	

Tulsa Analytical Services' Vax Multichrom



Analysis Name : [PRODUCT] 13 042195A, 2, 1.  
 PRODUCT REFERENCE Amount : 1.000



Instrument : HP5890  
 Channel Title : Channel #13  
 Lims ID :  
 Acquired on 21-APR-1995 at 16:49  
 Reported on 24-APR-1995 at 13:37

Method : PRODUCT  
 Calibration : PRODUCT  
 Run Sequence : PRODUCT

Multichrom

Injection Report

Acquired on 21-APR-1995 at 16:49

Tulsa Analytical Services' Vax Multichrom

Analyst Name : DGH/"Bulldog"  
Lims Id :  
Comment : Superior Terminal, Superior WI  
Method Title : Product Analysis  
Sample Name : PRODUCT REFERENCE  
Sample Id :  
Sample Type : Sample Amount=1.00000  
Bottle No : 1

PEAK INFORMATION

<u>RT mins</u>	<u>Area uVs</u>	<u>Peak name</u>	<u>Width</u>
1.409	264365	C5	1.1A
2.107	225768	C6	1.6A
2.493	273257	2,4-Dimethylpentane	1.9
2.813	316753	Benzene	1.9
3.609	297066	2,2,4-Trimethylpentane	2.7
3.889	279927	C7	2.4
4.311	286893	Methylcyclohexane	2.7
5.213	338488	Toluene	2.9
6.480	294166	C8	2.9
7.711	368756	Ethylbenzene	3.2
7.973	372869	m/p-Xylene	3.2
8.516	361299	o-Xylene	3.2
9.093	323407	C9	3.2
10.453	355521	1,3,5-Trimethylbenzene	3.5
11.031	374056	1,2,4-Trimethylbenzene	3.5
11.493	350767	C10	3.5
15.004	437631	Naphthalene	4.0
15.716	367950	C12	3.5
19.378	394228	C14	3.7
22.622	415728	C16	4.3
24.116	409124	C17	4.3
25.538	418227	C18	4.3
28.173	406909	C20	4.5
32.787	396782	C24	4.3
36.720	380324	C28	4.5

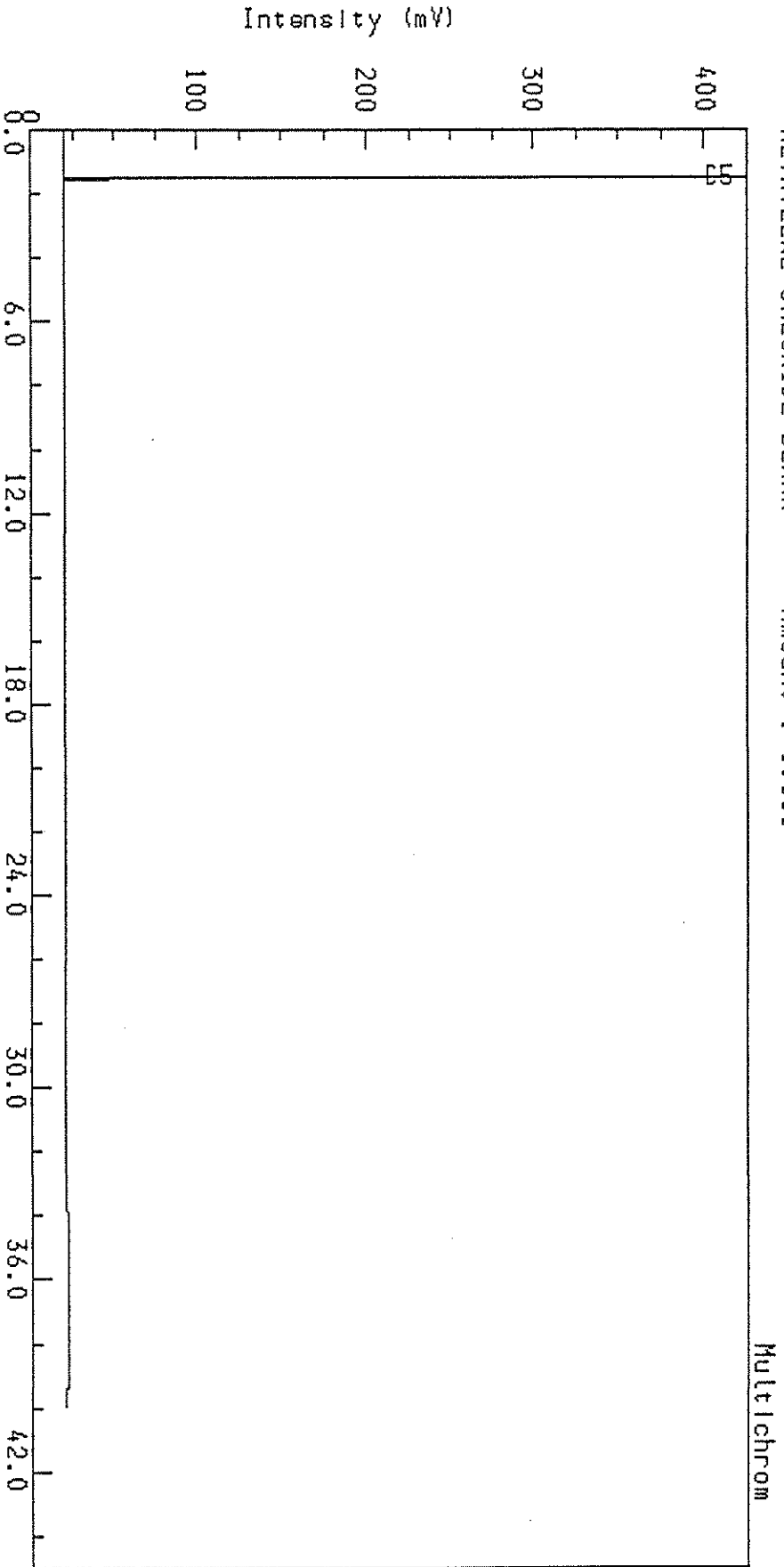
Totals

Unknowns 39385  
8710259  
8749644

Tulsa Analytical Services' Vax Multichrom



Analysis Name : [PRODUCT] 13 042195A,1,1.  
METHYLENE CHLORIDE BLANK Amount : 1.000



Instrument : HP5890  
Channel Title : Channel #13  
Time ID :  
Acquired on 21-APR-1995 at 15:56  
Reported on 22-APR-1995 at 15:10  
Method : PRODUCT  
Calibration : PRODUCT  
Run Sequence : PRODUCT

[PRODUCT] 13 042195A,1,1  
Reported on 22-APR-1995 at 15:00  
Modified on 22-APR-1995 at 14:56

---

Injection Report

Acquired on 21-APR-1995 at 15:56

Tulsa Analytical Services' Vax Multichrom

Analyst Name : DGH/"Bulldog"  
Lims Id :  
Comment : Superior Terminal, Superior WI  
Method Title : Product Analysis  
Sample Name : METHYLENE CHLORIDE BLANK  
Sample Id :  
Sample Type : Sample Amount=1.00000  
Bottle No : 1

PEAK INFORMATION

<u>RT mins</u>	<u>Area uVs</u>	<u>Peak name</u>	<u>Width</u>
1.511	668670	C5	1.1A

Totals

Unknowns	0
	668670
	668670

Analysis List

ANALYST NAME..... DGH/"Bulldog"  
Superior Terminal, Superior WI

ANALYSIS INFORMATION

Analysis name..... 042195A  
Method name..... product  
Calibration name..... product  
Calibration sequence..... Sequential Standard

SAMPLE SUMMARY

SAMPLE NUMBER	LIMS ID	SAMPLE NAME
1	-----	METHYLENE CHLORIDE BLANK
2	-----	PRODUCT REFERENCE
3	MW-1	95H0075, Superior Terminal, WI
4	MW-2	95H0076, Superior Terminal, WI
5	MW-14	95H0077, Superior Terminal, WI
6	MW-32	95H0084, Superior Terminal, WI
7	MW-22	95H0078, Superior Terminal, WI
8	MW-23	95H0079, Superior Terminal, WI
9	MW-24	95H0080, Superior Terminal, WI
10	MW-25	95H0081, Superior Terminal, WI
11	-----	methylene chloride
12	-----	GC TEST
13	mw-26	95H0082, Superior Terminal, WI
14	mw-27	95H0083, Superior Terminal, WI
15	RW-1	95H0085, Superior Terminal, WI
16	RW-2	95H0086, Superior Terminal, WI
17	RW-4	95H0087, Superior Terminal, WI
18	RW-5	95H0088, Superior Terminal, WI
19	RW-6	95H0089, Superior Terminal, WI
20	-----	methylene chloride

SAMPLE INFORMATION

SAMPLE NUMBER	TYPE	CALIB LEVEL	UPDATE RT	RF	AMOUNT	NUM INJ	BOT NUM
1	Sa	--	-	-	1.00000	1	1
2	Sa	--	-	-	1.00000	1	1
3	Sa	--	-	-	1.00000	1	2
4	Sa	--	-	-	1.00000	1	4
5	Sa	--	-	-	1.00000	1	5
6	Sa	--	-	-	1.00000	1	6
7	Sa	--	-	-	1.00000	1	7
8	Sa	--	-	-	1.00000	1	8
9	Sa	--	-	-	1.00000	1	9

SAMPLE NUMBER	TYPE	CALIB LEVEL	UPDATE RT	RF	AMOUNT	NUM INJ	BOT NUM
10	Sa	--	-	-	1.00000	1	10
11	Sa	--	-	-	1.00000	1	11
12	Sa	--	-	-	1.00000	1	12
13	Sa	--	-	-	1.00000	1	13
14	Sa	--	-	-	1.00000	1	14
15	Sa	--	-	-	1.00000	1	15
16	Sa	--	-	-	1.00000	1	16
17	Sa	--	-	-	1.00000	1	17
18	Sa	--	-	-	1.00000	1	18
19	Sa	--	-	-	1.00000	1	19
20	Sa	--	-	-	1.00000	1	20

INTERNAL/DILUTION STANDARDS

SAMPLE NUMBER	ISTD1 AMOUNT	ISTD2 AMOUNT	ISTD3 AMOUNT	DIL1 AMOUNT	DIL2 AMOUNT
1	1.00000	1.00000	1.00000	1.00000	1.00000
2	1.00000	1.00000	1.00000	1.00000	1.00000
3	1.00000	1.00000	1.00000	1.00000	1.00000
4	1.00000	1.00000	1.00000	1.00000	1.00000
5	1.00000	1.00000	1.00000	1.00000	1.00000
6	1.00000	1.00000	1.00000	1.00000	1.00000
7	1.00000	1.00000	1.00000	1.00000	1.00000
8	1.00000	1.00000	1.00000	1.00000	1.00000
9	1.00000	1.00000	1.00000	1.00000	1.00000
10	1.00000	1.00000	1.00000	1.00000	1.00000
11	1.00000	1.00000	1.00000	1.00000	1.00000
12	1.00000	1.00000	1.00000	1.00000	1.00000
13	1.00000	1.00000	1.00000	1.00000	1.00000
14	1.00000	1.00000	1.00000	1.00000	1.00000
15	1.00000	1.00000	1.00000	1.00000	1.00000
16	1.00000	1.00000	1.00000	1.00000	1.00000
17	1.00000	1.00000	1.00000	1.00000	1.00000
18	1.00000	1.00000	1.00000	1.00000	1.00000
19	1.00000	1.00000	1.00000	1.00000	1.00000
20	1.00000	1.00000	1.00000	1.00000	1.00000

PROCESSING ORDER

SAMPLE NUMBER	TYPE
1	Sample
2	Sample
3	Sample
4	Sample
5	Sample
6	Sample
7	Sample
8	Sample



---

SAMPLE NUMBER	TYPE
9	Sample
10	Sample
11	Sample
12	Sample
13	Sample
14	Sample
15	Sample
16	Sample
17	Sample
18	Sample
19	Sample
20	Sample

April 15, 1996

Product Characterizations - Plume Definition  
Superior Terminal, Superior, Wisconsin

See Attachment (Plume Map drawn over Figure 2 from Delta 2/27/95 Report)

Essentially the products are as described in May 26, 1995 letter from Lyle Bruce and T.J. Nagengast. I have attempted to show separations and overlaps of various possible plumes based on subtle differences in some of the chromatograms.

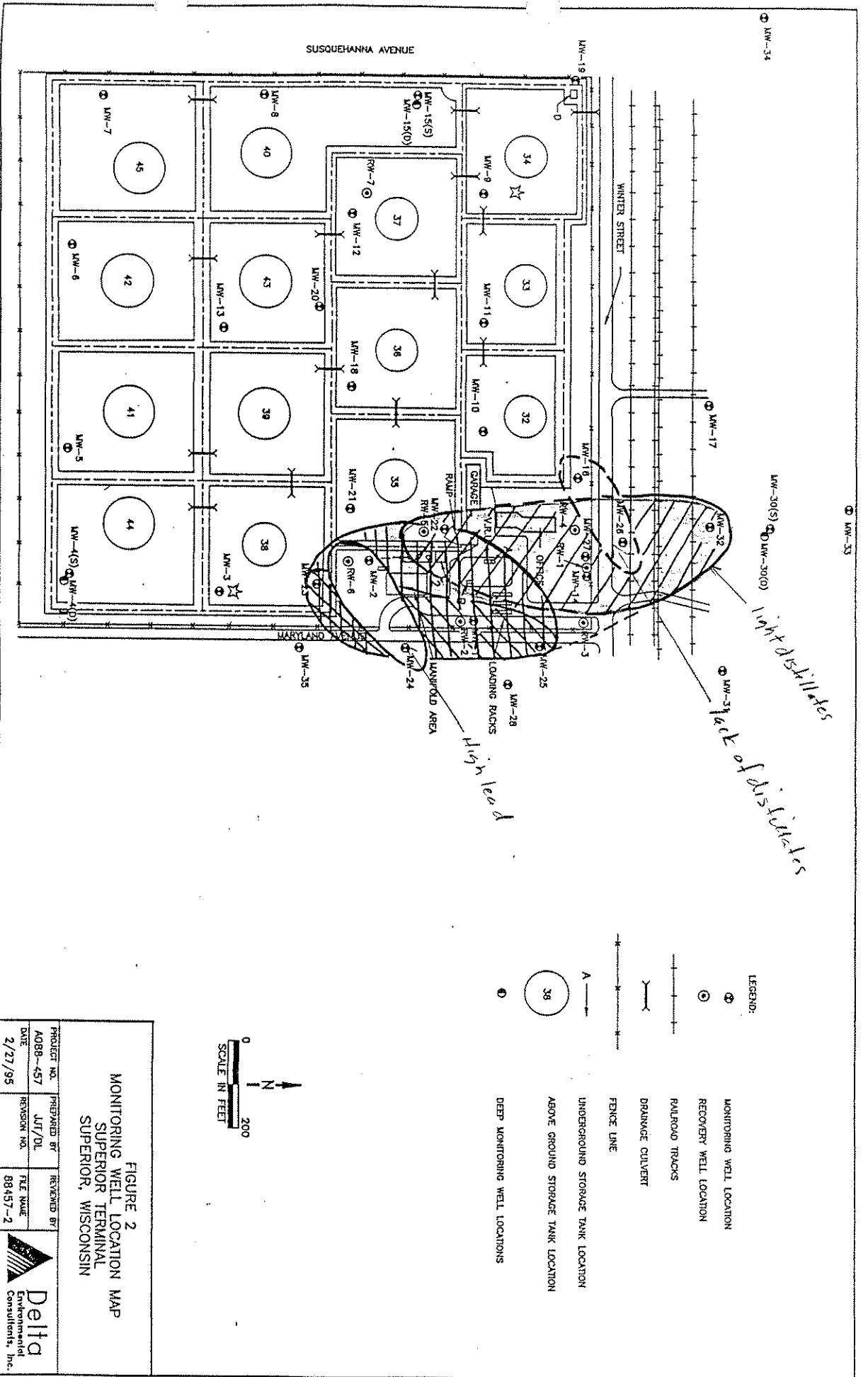
The plume at MW-2, MW-24 and RW-6 is obviously different from what is seen in other nearby wells (note significantly higher lead as one example of different characteristics), and is a more recent occurrence, having apparently moved early products out of the way. (This is apparent because, although there is little evidence of overprinting, MW-23 and MW-1/RW-2 are obviously from the same source. Also, all other product has a significant and obvious distillate fraction.)

The plume with the horizontal lines represents product with similar characteristic in the distillate fraction, whereas the distillate in the plume with diagonals from upper left to lower right appears to be slightly different (lighter - more like kerosene or light diesel, as opposed to diesel/fuel oil description for other plume). Some of the differences may be caused by mixing of plumes and relative amounts of naphtha-range material.

Separating MW-16 and MW-26 from the rest of the nearby wells was based on the lack of distillate in the sample. Some distillate may have been present, but relative concentrations were significantly less than other nearby wells. Other characteristics of the product from wells in the vicinity are similar, including lack of toluene and high MCH in the naphtha-range material (apparently not a gasoline, as pointed in characterization letter). The overlap of this plume with others at MW-22/RW-5 indicates the uncertainty of grouping mixtures, especially when it is unknown whether the products were mixed before the release, or after.

Hopefully these groupings will help define products and/or determine likely sources.

Thanks, Tim Nagengast



Data Entry Worksheet for Soil Samples -- Oil Specific Volume (OSV) Calculations

Project No. = 406 [ ] = User must enter the soil or fluid parameter, or lab data, as appropriate  
Boring Designation = EW-4

Soil Parameters

Fluid Parameters

Oil Parameters

Required to Estimate OSV - Soil

Required to Estimate OSV - Soil

$\rho_b$  = 1.6 g/cm<sup>3</sup> Bulk density of soil

$\rho_o$  = 0.7903 g/cm<sup>3</sup> Oil density

Soil Sample Data

Sample Intervals (maximum 21 samples)

	Feet (bgs)	to	Feet (bgs)	GRO or DRO (mg/kg)
1	[ ]		[ ]	[ ]
2	[ ]		[ ]	[ ]
3	[ ]		[ ]	[ ]
4	[ ]		[ ]	[ ]
5	[ ]		[ ]	[ ]
6	[ ]		[ ]	[ ]
7	[ ]		[ ]	[ ]
8	[ ]		[ ]	[ ]
9	[ ]		[ ]	[ ]
10	[ ]		[ ]	[ ]
11	[ ]		[ ]	[ ]
12	[ ]		[ ]	[ ]
13	[ ]		[ ]	[ ]
14	[ ]		[ ]	[ ]
15	[ ]		[ ]	[ ]
16	[ ]		[ ]	[ ]
17	[ ]		[ ]	[ ]
18	[ ]		[ ]	[ ]
19	[ ]		[ ]	[ ]
20	[ ]		[ ]	[ ]
21	[ ]		[ ]	[ ]

Deepest sample must be entered in this row

## Data Entry Worksheet for Monitoring Well Fluid Data -- Oil Specific Volume (OSV) Calculations

Project No. = 406  
Boring Designation = EW-4

= User must enter the soil or fluid parameter, or lab data, as appropriate

### Soil Parameters

#### Required to Estimate OSV - MWs

$\phi$  = 0.437 Total porosity  
 $\sigma_{ow}$  = 18.2 dynes/cm Oil/Water Interfacial Tension  
 $\sigma_{ao}$  = 22.7 dynes/cm Air/Oil Surface Tension  
 $\sigma_{aw}$  = 62.1 dynes/cm Air/Water Surface Tension  
 $\alpha$  = 0.125 /foot Van Genuchten mean pore-size parameter  
 $n$  = 3.00500 Van Genuchten pore-size distribution exponent  
 $S_m$  = 0.046 Irreducible water saturation

### Fluid Parameters

$\rho_{ro}$  = 0.7903 Ratio of oil to water density  
 $\beta_{ao}$  = 2.74 Ratio of water surface tension to oil surface tension  
 $\beta_{ow}$  = 3.41 Ratio of water surface tension to oil-water interfacial tension  
 $Z_{ow}$  = 20.85 feet Depth to oil/air interface  
 $Z_{ao}$  = 26.98 feet Depth to oil/water interface  
 $S_m$  = 0.046 Water saturation at field capacity  
 $\alpha$  = 0.125 /foot Van Genuchten mean pore-size parameter  
 $n$  = 3.00500 Van Genuchten pore-size distribution exponent  
 $m$  = 0.334443 Calculated from "n" (Burdine)  
 $dZ$  = 0.01 feet Integration increment (0.01 to 1.0)  
TOC = 636.9 feet Elevation of TOC or measuring point

Oil Specific Volume Calculation Spreadsheet for Soil Samples

Project No. 406  
Boring Designation EW-4

Depth (feet)	dZ (feet)	GRO or DRO (mg/kg)	$\theta_o$ (-)	$V_o$ (ft <sup>3</sup> /ft <sup>2</sup> )
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000

Oil Specific Volume = 0.000

**DO NOT CHANGE ANY CELLS ON THIS WORKSHEET**

Oil Specific Volume Calculation Spreadsheet for Free-phase Hydrocarbon in Monitoring Wells

Project No. 406  
 Boring Designation EW-4

**DO NOT CHANGE ANY CELLS ON THIS WORKSHEET**

Z (feet)	h <sub>ow</sub> (feet)	h <sub>ao</sub> (feet)	S <sub>w</sub> (--)	S <sub>of</sub> (--)	φ S <sub>of</sub> dZ (ft <sup>3</sup> /ft <sup>2</sup> )
Z <sub>u</sub> = 619.08	1.92	2.40	0.7582	0.0000	0.0000
619.07	1.92	2.39	0.7588	0.0011	0.0000
619.06	1.92	2.38	0.7593	0.0022	0.0000
619.05	1.92	2.37	0.7599	0.0033	0.0000
619.04	1.91	2.36	0.7604	0.0045	0.0000
619.03	1.91	2.36	0.7610	0.0056	0.0000
619.02	1.91	2.35	0.7615	0.0067	0.0000
619.01	1.91	2.34	0.7621	0.0078	0.0000
619.00	1.90	2.33	0.7626	0.0089	0.0000
618.99	1.90	2.33	0.7632	0.0100	0.0000
618.98	1.90	2.32	0.7637	0.0111	0.0000
618.97	1.90	2.31	0.7643	0.0122	0.0001
618.96	1.90	2.30	0.7648	0.0133	0.0001
618.95	1.89	2.29	0.7654	0.0144	0.0001
618.94	1.89	2.29	0.7659	0.0155	0.0001
618.93	1.89	2.28	0.7665	0.0166	0.0001
618.92	1.89	2.27	0.7670	0.0177	0.0001
618.91	1.89	2.26	0.7676	0.0188	0.0001
618.90	1.88	2.25	0.7681	0.0199	0.0001
618.89	1.88	2.25	0.7687	0.0210	0.0001
618.88	1.88	2.24	0.7692	0.0220	0.0001
618.87	1.88	2.23	0.7698	0.0231	0.0001
618.86	1.88	2.22	0.7703	0.0242	0.0001
618.85	1.87	2.21	0.7709	0.0253	0.0001
618.84	1.87	2.21	0.7714	0.0264	0.0001
618.83	1.87	2.20	0.7720	0.0274	0.0001
618.82	1.87	2.19	0.7725	0.0285	0.0001
618.81	1.86	2.18	0.7731	0.0296	0.0001
618.80	1.86	2.18	0.7736	0.0306	0.0001
618.79	1.86	2.17	0.7742	0.0317	0.0001
618.78	1.86	2.16	0.7747	0.0327	0.0001
618.77	1.86	2.15	0.7753	0.0338	0.0001
618.76	1.85	2.14	0.7758	0.0348	0.0002
618.75	1.85	2.14	0.7764	0.0359	0.0002
618.74	1.85	2.13	0.7769	0.0369	0.0002
618.73	1.85	2.12	0.7775	0.0380	0.0002
618.72	1.85	2.11	0.7780	0.0390	0.0002
618.71	1.84	2.10	0.7785	0.0400	0.0002
618.70	1.84	2.10	0.7791	0.0411	0.0002
618.69	1.84	2.09	0.7796	0.0421	0.0002
618.68	1.84	2.08	0.7802	0.0431	0.0002
618.67	1.84	2.07	0.7807	0.0441	0.0002
618.66	1.83	2.06	0.7813	0.0451	0.0002
618.65	1.83	2.06	0.7818	0.0462	0.0002
618.64	1.83	2.05	0.7824	0.0472	0.0002
618.63	1.83	2.04	0.7829	0.0482	0.0002
618.62	1.82	2.03	0.7834	0.0492	0.0002
618.61	1.82	2.02	0.7840	0.0502	0.0002
618.60	1.82	2.02	0.7845	0.0511	0.0002
618.59	1.82	2.01	0.7851	0.0521	0.0002
618.58	1.82	2.00	0.7856	0.0531	0.0002
618.57	1.81	1.99	0.7862	0.0541	0.0002
618.56	1.81	1.99	0.7867	0.0551	0.0002
618.55	1.81	1.98	0.7873	0.0560	0.0002
618.54	1.81	1.97	0.7878	0.0570	0.0002
618.53	1.81	1.96	0.7883	0.0579	0.0003
618.52	1.80	1.95	0.7889	0.0589	0.0003
618.51	1.80	1.95	0.7894	0.0598	0.0003
618.50	1.80	1.94	0.7900	0.0608	0.0003
618.49	1.80	1.93	0.7905	0.0617	0.0003
618.48	1.80	1.92	0.7910	0.0627	0.0003
618.47	1.79	1.91	0.7916	0.0636	0.0003
618.46	1.79	1.91	0.7921	0.0645	0.0003
618.45	1.79	1.90	0.7927	0.0654	0.0003
618.44	1.79	1.89	0.7932	0.0663	0.0003
618.43	1.79	1.88	0.7937	0.0672	0.0003
618.42	1.78	1.87	0.7943	0.0681	0.0003

$$Z_u = \rho_{ro} \beta_{ao} H_o / [\rho_{ro} \beta_{ao} - (1 - \rho_{ro}) \beta_{ow}]$$

= 619.08 feet

where:

ρ<sub>ro</sub> = 0.7903

β<sub>ao</sub> = 2.74

β<sub>ow</sub> = 3.41

H<sub>o</sub> = 6.13 feet

Z<sub>ow</sub> = 609.92 feet

Z<sub>ao</sub> = 616.05 feet

Other parameters used in calculations (from Data Entry - MWs)

S<sub>m</sub> = 0.046

α = 0.125 /foot

n = 3.005

m = 0.334442596

dZ = 0.01 feet      Integration increment (0.01 to 1.0)

φ = 0.437

Oil Specific Volume

Σφ S<sub>of</sub> dZ = 1.8798E-01 ft<sup>3</sup>/ft<sup>2</sup>      Oil Specific Volume

618.41	1.78	1.87	0.7948	0.0690	0.0003
618.40	1.78	1.86	0.7954	0.0699	0.0003
618.39	1.78	1.85	0.7959	0.0708	0.0003
618.38	1.77	1.84	0.7964	0.0717	0.0003
618.37	1.77	1.84	0.7970	0.0726	0.0003
618.36	1.77	1.83	0.7975	0.0734	0.0003
618.35	1.77	1.82	0.7980	0.0743	0.0003
618.34	1.77	1.81	0.7986	0.0751	0.0003
618.33	1.76	1.80	0.7991	0.0760	0.0003
618.32	1.76	1.80	0.7996	0.0768	0.0003
618.31	1.76	1.79	0.8002	0.0777	0.0003
618.30	1.76	1.78	0.8007	0.0785	0.0003
618.29	1.76	1.77	0.8012	0.0793	0.0003
618.28	1.75	1.76	0.8018	0.0801	0.0004
618.27	1.75	1.76	0.8023	0.0810	0.0004
618.26	1.75	1.75	0.8028	0.0818	0.0004
618.25	1.75	1.74	0.8034	0.0826	0.0004
618.24	1.75	1.73	0.8039	0.0834	0.0004
618.23	1.74	1.72	0.8044	0.0841	0.0004
618.22	1.74	1.72	0.8050	0.0849	0.0004
618.21	1.74	1.71	0.8055	0.0857	0.0004
618.20	1.74	1.70	0.8060	0.0865	0.0004
618.19	1.73	1.69	0.8066	0.0872	0.0004
618.18	1.73	1.69	0.8071	0.0880	0.0004
618.17	1.73	1.68	0.8076	0.0887	0.0004
618.16	1.73	1.67	0.8082	0.0894	0.0004
618.15	1.73	1.66	0.8087	0.0902	0.0004
618.14	1.72	1.65	0.8092	0.0909	0.0004
618.13	1.72	1.65	0.8098	0.0916	0.0004
618.12	1.72	1.64	0.8103	0.0923	0.0004
618.11	1.72	1.63	0.8108	0.0930	0.0004
618.10	1.72	1.62	0.8113	0.0937	0.0004
618.09	1.71	1.61	0.8119	0.0944	0.0004
618.08	1.71	1.61	0.8124	0.0951	0.0004
618.07	1.71	1.60	0.8129	0.0958	0.0004
618.06	1.71	1.59	0.8134	0.0964	0.0004
618.05	1.71	1.58	0.8140	0.0971	0.0004
618.04	1.70	1.57	0.8145	0.0978	0.0004
618.03	1.70	1.57	0.8150	0.0984	0.0004
618.02	1.70	1.56	0.8155	0.0990	0.0004
618.01	1.70	1.55	0.8161	0.0997	0.0004
618.00	1.69	1.54	0.8166	0.1003	0.0004
617.99	1.69	1.53	0.8171	0.1009	0.0004
617.98	1.69	1.53	0.8176	0.1015	0.0004
617.97	1.69	1.52	0.8182	0.1021	0.0004
617.96	1.69	1.51	0.8187	0.1027	0.0004
617.95	1.68	1.50	0.8192	0.1033	0.0005
617.94	1.68	1.50	0.8197	0.1039	0.0005
617.93	1.68	1.49	0.8202	0.1044	0.0005
617.92	1.68	1.48	0.8208	0.1050	0.0005
617.91	1.68	1.47	0.8213	0.1056	0.0005
617.90	1.67	1.46	0.8218	0.1061	0.0005
617.89	1.67	1.46	0.8223	0.1066	0.0005
617.88	1.67	1.45	0.8228	0.1072	0.0005
617.87	1.67	1.44	0.8234	0.1077	0.0005
617.86	1.67	1.43	0.8239	0.1082	0.0005
617.85	1.66	1.42	0.8244	0.1087	0.0005
617.84	1.66	1.42	0.8249	0.1092	0.0005
617.83	1.66	1.41	0.8254	0.1097	0.0005
617.82	1.66	1.40	0.8259	0.1102	0.0005
617.81	1.66	1.39	0.8265	0.1106	0.0005
617.80	1.65	1.38	0.8270	0.1111	0.0005
617.79	1.65	1.38	0.8275	0.1116	0.0005
617.78	1.65	1.37	0.8280	0.1120	0.0005
617.77	1.65	1.36	0.8285	0.1125	0.0005
617.76	1.64	1.35	0.8290	0.1129	0.0005
617.75	1.64	1.35	0.8295	0.1133	0.0005
617.74	1.64	1.34	0.8301	0.1137	0.0005
617.73	1.64	1.33	0.8306	0.1141	0.0005
617.72	1.64	1.32	0.8311	0.1145	0.0005
617.71	1.63	1.31	0.8316	0.1149	0.0005
617.70	1.63	1.31	0.8321	0.1153	0.0005
617.69	1.63	1.30	0.8326	0.1157	0.0005
617.68	1.63	1.29	0.8331	0.1161	0.0005
617.67	1.63	1.28	0.8336	0.1164	0.0005
617.66	1.62	1.27	0.8341	0.1168	0.0005
617.65	1.62	1.27	0.8346	0.1171	0.0005
617.64	1.62	1.26	0.8352	0.1175	0.0005
617.63	1.62	1.25	0.8357	0.1178	0.0005



617.62	1.62	1.24	0.8362	0.1181	0.0005
617.61	1.61	1.23	0.8367	0.1184	0.0005
617.60	1.61	1.23	0.8372	0.1187	0.0005
617.59	1.61	1.22	0.8377	0.1190	0.0005
617.58	1.61	1.21	0.8382	0.1193	0.0005
617.57	1.60	1.20	0.8387	0.1196	0.0005
617.56	1.60	1.20	0.8392	0.1199	0.0005
617.55	1.60	1.19	0.8397	0.1201	0.0005
617.54	1.60	1.18	0.8402	0.1204	0.0005
617.53	1.60	1.17	0.8407	0.1206	0.0005
617.52	1.59	1.16	0.8412	0.1209	0.0005
617.51	1.59	1.16	0.8417	0.1211	0.0005
617.50	1.59	1.15	0.8422	0.1213	0.0005
617.49	1.59	1.14	0.8427	0.1215	0.0005
617.48	1.59	1.13	0.8432	0.1217	0.0005
617.47	1.58	1.12	0.8437	0.1219	0.0005
617.46	1.58	1.12	0.8442	0.1221	0.0005
617.45	1.58	1.11	0.8447	0.1223	0.0005
617.44	1.58	1.10	0.8452	0.1225	0.0005
617.43	1.58	1.09	0.8457	0.1227	0.0005
617.42	1.57	1.08	0.8462	0.1228	0.0005
617.41	1.57	1.08	0.8467	0.1230	0.0005
617.40	1.57	1.07	0.8472	0.1231	0.0005
617.39	1.57	1.06	0.8477	0.1233	0.0005
617.38	1.56	1.05	0.8482	0.1234	0.0005
617.37	1.56	1.04	0.8487	0.1235	0.0005
617.36	1.56	1.04	0.8491	0.1236	0.0005
617.35	1.56	1.03	0.8496	0.1237	0.0005
617.34	1.56	1.02	0.8501	0.1238	0.0005
617.33	1.55	1.01	0.8506	0.1239	0.0005
617.32	1.55	1.01	0.8511	0.1240	0.0005
617.31	1.55	1.00	0.8516	0.1241	0.0005
617.30	1.55	0.99	0.8521	0.1241	0.0005
617.29	1.55	0.98	0.8526	0.1242	0.0005
617.28	1.54	0.97	0.8531	0.1243	0.0005
617.27	1.54	0.97	0.8535	0.1243	0.0005
617.26	1.54	0.96	0.8540	0.1243	0.0005
617.25	1.54	0.95	0.8545	0.1244	0.0005
617.24	1.54	0.94	0.8550	0.1244	0.0005
617.23	1.53	0.93	0.8555	0.1244	0.0005
617.22	1.53	0.93	0.8560	0.1244	0.0005
617.21	1.53	0.92	0.8565	0.1244	0.0005
617.20	1.53	0.91	0.8569	0.1244	0.0005
617.19	1.52	0.90	0.8574	0.1244	0.0005
617.18	1.52	0.89	0.8579	0.1244	0.0005
617.17	1.52	0.89	0.8584	0.1244	0.0005
617.16	1.52	0.88	0.8589	0.1243	0.0005
617.15	1.52	0.87	0.8593	0.1243	0.0005
617.14	1.51	0.86	0.8598	0.1242	0.0005
617.13	1.51	0.86	0.8603	0.1242	0.0005
617.12	1.51	0.85	0.8608	0.1241	0.0005
617.11	1.51	0.84	0.8613	0.1241	0.0005
617.10	1.51	0.83	0.8617	0.1240	0.0005
617.09	1.50	0.82	0.8622	0.1239	0.0005
617.08	1.50	0.82	0.8627	0.1238	0.0005
617.07	1.50	0.81	0.8632	0.1237	0.0005
617.06	1.50	0.80	0.8636	0.1236	0.0005
617.05	1.50	0.79	0.8641	0.1235	0.0005
617.04	1.49	0.78	0.8646	0.1234	0.0005
617.03	1.49	0.78	0.8651	0.1233	0.0005
617.02	1.49	0.77	0.8655	0.1232	0.0005
617.01	1.49	0.76	0.8660	0.1230	0.0005
617.00	1.49	0.75	0.8665	0.1229	0.0005
616.99	1.48	0.74	0.8669	0.1228	0.0005
616.98	1.48	0.74	0.8674	0.1226	0.0005
616.97	1.48	0.73	0.8679	0.1225	0.0005
616.96	1.48	0.72	0.8683	0.1223	0.0005
616.95	1.47	0.71	0.8688	0.1221	0.0005
616.94	1.47	0.71	0.8693	0.1220	0.0005
616.93	1.47	0.70	0.8697	0.1218	0.0005
616.92	1.47	0.69	0.8702	0.1216	0.0005
616.91	1.47	0.68	0.8707	0.1214	0.0005
616.90	1.46	0.67	0.8711	0.1212	0.0005
616.89	1.46	0.67	0.8716	0.1210	0.0005
616.88	1.46	0.66	0.8721	0.1208	0.0005
616.87	1.46	0.65	0.8725	0.1206	0.0005
616.86	1.46	0.64	0.8730	0.1204	0.0005
616.85	1.45	0.63	0.8734	0.1202	0.0005
616.84	1.45	0.63	0.8739	0.1200	0.0005

616.83	1.45	0.62	0.8744	0.1197	0.0005
616.82	1.45	0.61	0.8748	0.1195	0.0005
616.81	1.45	0.60	0.8753	0.1192	0.0005
616.80	1.44	0.59	0.8757	0.1190	0.0005
616.79	1.44	0.59	0.8762	0.1188	0.0005
616.78	1.44	0.58	0.8766	0.1185	0.0005
616.77	1.44	0.57	0.8771	0.1182	0.0005
616.76	1.43	0.56	0.8775	0.1180	0.0005
616.75	1.43	0.55	0.8780	0.1177	0.0005
616.74	1.43	0.55	0.8785	0.1174	0.0005
616.73	1.43	0.54	0.8789	0.1172	0.0005
616.72	1.43	0.53	0.8794	0.1169	0.0005
616.71	1.42	0.52	0.8798	0.1166	0.0005
616.70	1.42	0.52	0.8803	0.1163	0.0005
616.69	1.42	0.51	0.8807	0.1160	0.0005
616.68	1.42	0.50	0.8812	0.1157	0.0005
616.67	1.42	0.49	0.8816	0.1154	0.0005
616.66	1.41	0.48	0.8820	0.1151	0.0005
616.65	1.41	0.48	0.8825	0.1148	0.0005
616.64	1.41	0.47	0.8829	0.1145	0.0005
616.63	1.41	0.46	0.8834	0.1142	0.0005
616.62	1.41	0.45	0.8838	0.1138	0.0005
616.61	1.40	0.44	0.8843	0.1135	0.0005
616.60	1.40	0.44	0.8847	0.1132	0.0005
616.59	1.40	0.43	0.8852	0.1129	0.0005
616.58	1.40	0.42	0.8856	0.1125	0.0005
616.57	1.39	0.41	0.8860	0.1122	0.0005
616.56	1.39	0.40	0.8865	0.1119	0.0005
616.55	1.39	0.40	0.8869	0.1115	0.0005
616.54	1.39	0.39	0.8873	0.1112	0.0005
616.53	1.39	0.38	0.8878	0.1108	0.0005
616.52	1.38	0.37	0.8882	0.1105	0.0005
616.51	1.38	0.37	0.8887	0.1101	0.0005
616.50	1.38	0.36	0.8891	0.1098	0.0005
616.49	1.38	0.35	0.8895	0.1094	0.0005
616.48	1.38	0.34	0.8900	0.1090	0.0005
616.47	1.37	0.33	0.8904	0.1087	0.0005
616.46	1.37	0.33	0.8908	0.1083	0.0005
616.45	1.37	0.32	0.8913	0.1079	0.0005
616.44	1.37	0.31	0.8917	0.1076	0.0005
616.43	1.37	0.30	0.8921	0.1072	0.0005
616.42	1.36	0.29	0.8925	0.1068	0.0005
616.41	1.36	0.29	0.8930	0.1064	0.0005
616.40	1.36	0.28	0.8934	0.1061	0.0005
616.39	1.36	0.27	0.8938	0.1057	0.0005
616.38	1.36	0.26	0.8942	0.1053	0.0005
616.37	1.35	0.25	0.8947	0.1049	0.0005
616.36	1.35	0.25	0.8951	0.1045	0.0005
616.35	1.35	0.24	0.8955	0.1041	0.0005
616.34	1.35	0.23	0.8959	0.1038	0.0005
616.33	1.34	0.22	0.8964	0.1034	0.0005
616.32	1.34	0.22	0.8968	0.1030	0.0004
616.31	1.34	0.21	0.8972	0.1026	0.0004
616.30	1.34	0.20	0.8976	0.1022	0.0004
616.29	1.34	0.19	0.8980	0.1018	0.0004
616.28	1.33	0.18	0.8985	0.1014	0.0004
616.27	1.33	0.18	0.8989	0.1010	0.0004
616.26	1.33	0.17	0.8993	0.1006	0.0004
616.25	1.33	0.16	0.8997	0.1002	0.0004
616.24	1.33	0.15	0.9001	0.0998	0.0004
616.23	1.32	0.14	0.9005	0.0994	0.0004
616.22	1.32	0.14	0.9009	0.0990	0.0004
616.21	1.32	0.13	0.9014	0.0986	0.0004
616.20	1.32	0.12	0.9018	0.0982	0.0004
616.19	1.32	0.11	0.9022	0.0978	0.0004
616.18	1.31	0.10	0.9026	0.0974	0.0004
616.17	1.31	0.10	0.9030	0.0970	0.0004
616.16	1.31	0.09	0.9034	0.0966	0.0004
616.15	1.31	0.08	0.9038	0.0962	0.0004
616.14	1.30	0.07	0.9042	0.0958	0.0004
616.13	1.30	0.06	0.9046	0.0954	0.0004
616.12	1.30	0.06	0.9050	0.0950	0.0004
616.11	1.30	0.05	0.9054	0.0946	0.0004
616.10	1.30	0.04	0.9058	0.0942	0.0004
616.09	1.29	0.03	0.9062	0.0938	0.0004
616.08	1.29	0.03	0.9066	0.0934	0.0004
616.07	1.29	0.02	0.9070	0.0930	0.0004
616.06	1.29	0.01	0.9074	0.0926	0.0004
616.05	1.29	0.00	0.9078	0.0922	0.0004

616.04	1.28	0.00	0.9082	0.0918	0.0004
616.03	1.28	0.00	0.9086	0.0914	0.0004
616.02	1.28	0.00	0.9090	0.0910	0.0004
616.01	1.28	0.00	0.9094	0.0906	0.0004
616.00	1.28	0.00	0.9098	0.0902	0.0004
615.99	1.27	0.00	0.9102	0.0898	0.0004
615.98	1.27	0.00	0.9106	0.0894	0.0004
615.97	1.27	0.00	0.9110	0.0890	0.0004
615.96	1.27	0.00	0.9114	0.0886	0.0004
615.95	1.26	0.00	0.9118	0.0882	0.0004
615.94	1.26	0.00	0.9122	0.0878	0.0004
615.93	1.26	0.00	0.9125	0.0875	0.0004
615.92	1.26	0.00	0.9129	0.0871	0.0004
615.91	1.26	0.00	0.9133	0.0867	0.0004
615.90	1.25	0.00	0.9137	0.0863	0.0004
615.89	1.25	0.00	0.9141	0.0859	0.0004
615.88	1.25	0.00	0.9145	0.0855	0.0004
615.87	1.25	0.00	0.9149	0.0851	0.0004
615.86	1.25	0.00	0.9152	0.0848	0.0004
615.85	1.24	0.00	0.9156	0.0844	0.0004
615.84	1.24	0.00	0.9160	0.0840	0.0004
615.83	1.24	0.00	0.9164	0.0836	0.0004
615.82	1.24	0.00	0.9168	0.0832	0.0004
615.81	1.24	0.00	0.9171	0.0829	0.0004
615.80	1.23	0.00	0.9175	0.0825	0.0004
615.79	1.23	0.00	0.9179	0.0821	0.0004
615.78	1.23	0.00	0.9183	0.0817	0.0004
615.77	1.23	0.00	0.9186	0.0814	0.0004
615.76	1.23	0.00	0.9190	0.0810	0.0004
615.75	1.22	0.00	0.9194	0.0806	0.0004
615.74	1.22	0.00	0.9198	0.0802	0.0004
615.73	1.22	0.00	0.9201	0.0799	0.0003
615.72	1.22	0.00	0.9205	0.0795	0.0003
615.71	1.21	0.00	0.9209	0.0791	0.0003
615.70	1.21	0.00	0.9212	0.0788	0.0003
615.69	1.21	0.00	0.9216	0.0784	0.0003
615.68	1.21	0.00	0.9220	0.0780	0.0003
615.67	1.21	0.00	0.9223	0.0777	0.0003
615.66	1.20	0.00	0.9227	0.0773	0.0003
615.65	1.20	0.00	0.9231	0.0769	0.0003
615.64	1.20	0.00	0.9234	0.0766	0.0003
615.63	1.20	0.00	0.9238	0.0762	0.0003
615.62	1.20	0.00	0.9241	0.0759	0.0003
615.61	1.19	0.00	0.9245	0.0755	0.0003
615.60	1.19	0.00	0.9249	0.0751	0.0003
615.59	1.19	0.00	0.9252	0.0748	0.0003
615.58	1.19	0.00	0.9256	0.0744	0.0003
615.57	1.19	0.00	0.9259	0.0741	0.0003
615.56	1.18	0.00	0.9263	0.0737	0.0003
615.55	1.18	0.00	0.9266	0.0734	0.0003
615.54	1.18	0.00	0.9270	0.0730	0.0003
615.53	1.18	0.00	0.9274	0.0726	0.0003
615.52	1.17	0.00	0.9277	0.0723	0.0003
615.51	1.17	0.00	0.9281	0.0719	0.0003
615.50	1.17	0.00	0.9284	0.0716	0.0003
615.49	1.17	0.00	0.9288	0.0712	0.0003
615.48	1.17	0.00	0.9291	0.0709	0.0003
615.47	1.16	0.00	0.9295	0.0705	0.0003
615.46	1.16	0.00	0.9298	0.0702	0.0003
615.45	1.16	0.00	0.9301	0.0699	0.0003
615.44	1.16	0.00	0.9305	0.0695	0.0003
615.43	1.16	0.00	0.9308	0.0692	0.0003
615.42	1.15	0.00	0.9312	0.0688	0.0003
615.41	1.15	0.00	0.9315	0.0685	0.0003
615.40	1.15	0.00	0.9319	0.0681	0.0003
615.39	1.15	0.00	0.9322	0.0678	0.0003
615.38	1.15	0.00	0.9325	0.0675	0.0003
615.37	1.14	0.00	0.9329	0.0671	0.0003
615.36	1.14	0.00	0.9332	0.0668	0.0003
615.35	1.14	0.00	0.9336	0.0664	0.0003
615.34	1.14	0.00	0.9339	0.0661	0.0003
615.33	1.13	0.00	0.9342	0.0658	0.0003
615.32	1.13	0.00	0.9346	0.0654	0.0003
615.31	1.13	0.00	0.9349	0.0651	0.0003
615.30	1.13	0.00	0.9352	0.0648	0.0003
615.29	1.13	0.00	0.9356	0.0644	0.0003
615.28	1.12	0.00	0.9359	0.0641	0.0003
615.27	1.12	0.00	0.9362	0.0638	0.0003
615.26	1.12	0.00	0.9365	0.0635	0.0003

615.25	1.12	0.00	0.9369	0.0631	0.0003
615.24	1.12	0.00	0.9372	0.0628	0.0003
615.23	1.11	0.00	0.9375	0.0625	0.0003
615.22	1.11	0.00	0.9378	0.0622	0.0003
615.21	1.11	0.00	0.9382	0.0618	0.0003
615.20	1.11	0.00	0.9385	0.0615	0.0003
615.19	1.11	0.00	0.9388	0.0612	0.0003
615.18	1.10	0.00	0.9391	0.0609	0.0003
615.17	1.10	0.00	0.9394	0.0606	0.0003
615.16	1.10	0.00	0.9398	0.0602	0.0003
615.15	1.10	0.00	0.9401	0.0599	0.0003
615.14	1.10	0.00	0.9404	0.0596	0.0003
615.13	1.09	0.00	0.9407	0.0593	0.0003
615.12	1.09	0.00	0.9410	0.0590	0.0003
615.11	1.09	0.00	0.9413	0.0587	0.0003
615.10	1.09	0.00	0.9417	0.0583	0.0003
615.09	1.08	0.00	0.9420	0.0580	0.0003
615.08	1.08	0.00	0.9423	0.0577	0.0003
615.07	1.08	0.00	0.9426	0.0574	0.0003
615.06	1.08	0.00	0.9429	0.0571	0.0002
615.05	1.08	0.00	0.9432	0.0568	0.0002
615.04	1.07	0.00	0.9435	0.0565	0.0002
615.03	1.07	0.00	0.9438	0.0562	0.0002
615.02	1.07	0.00	0.9441	0.0559	0.0002
615.01	1.07	0.00	0.9444	0.0556	0.0002
615.00	1.07	0.00	0.9447	0.0553	0.0002
614.99	1.06	0.00	0.9450	0.0550	0.0002
614.98	1.06	0.00	0.9453	0.0547	0.0002
614.97	1.06	0.00	0.9456	0.0544	0.0002
614.96	1.06	0.00	0.9459	0.0541	0.0002
614.95	1.06	0.00	0.9462	0.0538	0.0002
614.94	1.05	0.00	0.9465	0.0535	0.0002
614.93	1.05	0.00	0.9468	0.0532	0.0002
614.92	1.05	0.00	0.9471	0.0529	0.0002
614.91	1.05	0.00	0.9474	0.0526	0.0002
614.90	1.04	0.00	0.9477	0.0523	0.0002
614.89	1.04	0.00	0.9480	0.0520	0.0002
614.88	1.04	0.00	0.9483	0.0517	0.0002
614.87	1.04	0.00	0.9486	0.0514	0.0002
614.86	1.04	0.00	0.9489	0.0511	0.0002
614.85	1.03	0.00	0.9492	0.0508	0.0002
614.84	1.03	0.00	0.9495	0.0505	0.0002
614.83	1.03	0.00	0.9498	0.0502	0.0002
614.82	1.03	0.00	0.9500	0.0500	0.0002
614.81	1.03	0.00	0.9503	0.0497	0.0002
614.80	1.02	0.00	0.9506	0.0494	0.0002
614.79	1.02	0.00	0.9509	0.0491	0.0002
614.78	1.02	0.00	0.9512	0.0488	0.0002
614.77	1.02	0.00	0.9515	0.0485	0.0002
614.76	1.02	0.00	0.9517	0.0483	0.0002
614.75	1.01	0.00	0.9520	0.0480	0.0002
614.74	1.01	0.00	0.9523	0.0477	0.0002
614.73	1.01	0.00	0.9526	0.0474	0.0002
614.72	1.01	0.00	0.9529	0.0471	0.0002
614.71	1.00	0.00	0.9531	0.0469	0.0002
614.70	1.00	0.00	0.9534	0.0466	0.0002
614.69	1.00	0.00	0.9537	0.0463	0.0002
614.68	1.00	0.00	0.9540	0.0460	0.0002
614.67	1.00	0.00	0.9542	0.0458	0.0002
614.66	0.99	0.00	0.9545	0.0455	0.0002
614.65	0.99	0.00	0.9548	0.0452	0.0002
614.64	0.99	0.00	0.9550	0.0450	0.0002
614.63	0.99	0.00	0.9553	0.0447	0.0002
614.62	0.99	0.00	0.9556	0.0444	0.0002
614.61	0.98	0.00	0.9559	0.0441	0.0002
614.60	0.98	0.00	0.9561	0.0439	0.0002
614.59	0.98	0.00	0.9564	0.0436	0.0002
614.58	0.98	0.00	0.9566	0.0434	0.0002
614.57	0.98	0.00	0.9569	0.0431	0.0002
614.56	0.97	0.00	0.9572	0.0428	0.0002
614.55	0.97	0.00	0.9574	0.0426	0.0002
614.54	0.97	0.00	0.9577	0.0423	0.0002
614.53	0.97	0.00	0.9580	0.0420	0.0002
614.52	0.97	0.00	0.9582	0.0418	0.0002
614.51	0.96	0.00	0.9585	0.0415	0.0002
614.50	0.96	0.00	0.9587	0.0413	0.0002
614.49	0.96	0.00	0.9590	0.0410	0.0002
614.48	0.96	0.00	0.9592	0.0408	0.0002
614.47	0.95	0.00	0.9595	0.0405	0.0002

614.46	0.95	0.00	0.9597	0.0403	0.0002
614.45	0.95	0.00	0.9600	0.0400	0.0002
614.44	0.95	0.00	0.9602	0.0398	0.0002
614.43	0.95	0.00	0.9605	0.0395	0.0002
614.42	0.94	0.00	0.9607	0.0393	0.0002
614.41	0.94	0.00	0.9610	0.0390	0.0002
614.40	0.94	0.00	0.9612	0.0388	0.0002
614.39	0.94	0.00	0.9615	0.0385	0.0002
614.38	0.94	0.00	0.9617	0.0383	0.0002
614.37	0.93	0.00	0.9620	0.0380	0.0002
614.36	0.93	0.00	0.9622	0.0378	0.0002
614.35	0.93	0.00	0.9625	0.0375	0.0002
614.34	0.93	0.00	0.9627	0.0373	0.0002
614.33	0.93	0.00	0.9629	0.0371	0.0002
614.32	0.92	0.00	0.9632	0.0368	0.0002
614.31	0.92	0.00	0.9634	0.0366	0.0002
614.30	0.92	0.00	0.9637	0.0363	0.0002
614.29	0.92	0.00	0.9639	0.0361	0.0002
614.28	0.91	0.00	0.9641	0.0359	0.0002
614.27	0.91	0.00	0.9644	0.0356	0.0002
614.26	0.91	0.00	0.9646	0.0354	0.0002
614.25	0.91	0.00	0.9648	0.0352	0.0002
614.24	0.91	0.00	0.9651	0.0349	0.0002
614.23	0.90	0.00	0.9653	0.0347	0.0002
614.22	0.90	0.00	0.9655	0.0345	0.0002
614.21	0.90	0.00	0.9658	0.0342	0.0001
614.20	0.90	0.00	0.9660	0.0340	0.0001
614.19	0.90	0.00	0.9662	0.0338	0.0001
614.18	0.89	0.00	0.9664	0.0336	0.0001
614.17	0.89	0.00	0.9667	0.0333	0.0001
614.16	0.89	0.00	0.9669	0.0331	0.0001
614.15	0.89	0.00	0.9671	0.0329	0.0001
614.14	0.89	0.00	0.9673	0.0327	0.0001
614.13	0.88	0.00	0.9676	0.0324	0.0001
614.12	0.88	0.00	0.9678	0.0322	0.0001
614.11	0.88	0.00	0.9680	0.0320	0.0001
614.10	0.88	0.00	0.9682	0.0318	0.0001
614.09	0.87	0.00	0.9684	0.0316	0.0001
614.08	0.87	0.00	0.9687	0.0313	0.0001
614.07	0.87	0.00	0.9689	0.0311	0.0001
614.06	0.87	0.00	0.9691	0.0309	0.0001
614.05	0.87	0.00	0.9693	0.0307	0.0001
614.04	0.86	0.00	0.9695	0.0305	0.0001
614.03	0.86	0.00	0.9697	0.0303	0.0001
614.02	0.86	0.00	0.9699	0.0301	0.0001
614.01	0.86	0.00	0.9702	0.0298	0.0001
614.00	0.86	0.00	0.9704	0.0296	0.0001
613.99	0.85	0.00	0.9706	0.0294	0.0001
613.98	0.85	0.00	0.9708	0.0292	0.0001
613.97	0.85	0.00	0.9710	0.0290	0.0001
613.96	0.85	0.00	0.9712	0.0288	0.0001
613.95	0.85	0.00	0.9714	0.0286	0.0001
613.94	0.84	0.00	0.9716	0.0284	0.0001
613.93	0.84	0.00	0.9718	0.0282	0.0001
613.92	0.84	0.00	0.9720	0.0280	0.0001
613.91	0.84	0.00	0.9722	0.0278	0.0001
613.90	0.84	0.00	0.9724	0.0276	0.0001
613.89	0.83	0.00	0.9726	0.0274	0.0001
613.88	0.83	0.00	0.9728	0.0272	0.0001
613.87	0.83	0.00	0.9730	0.0270	0.0001
613.86	0.83	0.00	0.9732	0.0268	0.0001
613.85	0.82	0.00	0.9734	0.0266	0.0001
613.84	0.82	0.00	0.9736	0.0264	0.0001
613.83	0.82	0.00	0.9738	0.0262	0.0001
613.82	0.82	0.00	0.9740	0.0260	0.0001
613.81	0.82	0.00	0.9742	0.0258	0.0001
613.80	0.81	0.00	0.9744	0.0256	0.0001
613.79	0.81	0.00	0.9746	0.0254	0.0001
613.78	0.81	0.00	0.9748	0.0252	0.0001
613.77	0.81	0.00	0.9750	0.0250	0.0001
613.76	0.81	0.00	0.9751	0.0249	0.0001
613.75	0.80	0.00	0.9753	0.0247	0.0001
613.74	0.80	0.00	0.9755	0.0245	0.0001
613.73	0.80	0.00	0.9757	0.0243	0.0001
613.72	0.80	0.00	0.9759	0.0241	0.0001
613.71	0.80	0.00	0.9761	0.0239	0.0001
613.70	0.79	0.00	0.9763	0.0237	0.0001
613.69	0.79	0.00	0.9764	0.0236	0.0001
613.68	0.79	0.00	0.9766	0.0234	0.0001

613.67	0.79	0.00	0.9768	0.0232	0.0001
613.66	0.78	0.00	0.9770	0.0230	0.0001
613.65	0.78	0.00	0.9772	0.0228	0.0001
613.64	0.78	0.00	0.9773	0.0227	0.0001
613.63	0.78	0.00	0.9775	0.0225	0.0001
613.62	0.78	0.00	0.9777	0.0223	0.0001
613.61	0.77	0.00	0.9779	0.0221	0.0001
613.60	0.77	0.00	0.9780	0.0220	0.0001
613.59	0.77	0.00	0.9782	0.0218	0.0001
613.58	0.77	0.00	0.9784	0.0216	0.0001
613.57	0.77	0.00	0.9786	0.0214	0.0001
613.56	0.76	0.00	0.9787	0.0213	0.0001
613.55	0.76	0.00	0.9789	0.0211	0.0001
613.54	0.76	0.00	0.9791	0.0209	0.0001
613.53	0.76	0.00	0.9792	0.0208	0.0001
613.52	0.76	0.00	0.9794	0.0206	0.0001
613.51	0.75	0.00	0.9796	0.0204	0.0001
613.50	0.75	0.00	0.9797	0.0203	0.0001
613.49	0.75	0.00	0.9799	0.0201	0.0001
613.48	0.75	0.00	0.9801	0.0199	0.0001
613.47	0.74	0.00	0.9802	0.0198	0.0001
613.46	0.74	0.00	0.9804	0.0196	0.0001
613.45	0.74	0.00	0.9806	0.0194	0.0001
613.44	0.74	0.00	0.9807	0.0193	0.0001
613.43	0.74	0.00	0.9809	0.0191	0.0001
613.42	0.73	0.00	0.9810	0.0190	0.0001
613.41	0.73	0.00	0.9812	0.0188	0.0001
613.40	0.73	0.00	0.9813	0.0187	0.0001
613.39	0.73	0.00	0.9815	0.0185	0.0001
613.38	0.73	0.00	0.9817	0.0183	0.0001
613.37	0.72	0.00	0.9818	0.0182	0.0001
613.36	0.72	0.00	0.9820	0.0180	0.0001
613.35	0.72	0.00	0.9821	0.0179	0.0001
613.34	0.72	0.00	0.9823	0.0177	0.0001
613.33	0.72	0.00	0.9824	0.0176	0.0001
613.32	0.71	0.00	0.9826	0.0174	0.0001
613.31	0.71	0.00	0.9827	0.0173	0.0001
613.30	0.71	0.00	0.9829	0.0171	0.0001
613.29	0.71	0.00	0.9830	0.0170	0.0001
613.28	0.71	0.00	0.9832	0.0168	0.0001
613.27	0.70	0.00	0.9833	0.0167	0.0001
613.26	0.70	0.00	0.9835	0.0165	0.0001
613.25	0.70	0.00	0.9836	0.0164	0.0001
613.24	0.70	0.00	0.9838	0.0162	0.0001
613.23	0.69	0.00	0.9839	0.0161	0.0001
613.22	0.69	0.00	0.9840	0.0160	0.0001
613.21	0.69	0.00	0.9842	0.0158	0.0001
613.20	0.69	0.00	0.9843	0.0157	0.0001
613.19	0.69	0.00	0.9845	0.0155	0.0001
613.18	0.68	0.00	0.9846	0.0154	0.0001
613.17	0.68	0.00	0.9847	0.0153	0.0001
613.16	0.68	0.00	0.9849	0.0151	0.0001
613.15	0.68	0.00	0.9850	0.0150	0.0001
613.14	0.68	0.00	0.9852	0.0148	0.0001
613.13	0.67	0.00	0.9853	0.0147	0.0001
613.12	0.67	0.00	0.9854	0.0146	0.0001
613.11	0.67	0.00	0.9856	0.0144	0.0001
613.10	0.67	0.00	0.9857	0.0143	0.0001
613.09	0.67	0.00	0.9858	0.0142	0.0001
613.08	0.66	0.00	0.9860	0.0140	0.0001
613.07	0.66	0.00	0.9861	0.0139	0.0001
613.06	0.66	0.00	0.9862	0.0138	0.0001
613.05	0.66	0.00	0.9863	0.0137	0.0001
613.04	0.65	0.00	0.9865	0.0135	0.0001
613.03	0.65	0.00	0.9866	0.0134	0.0001
613.02	0.65	0.00	0.9867	0.0133	0.0001
613.01	0.65	0.00	0.9869	0.0131	0.0001
613.00	0.65	0.00	0.9870	0.0130	0.0001
612.99	0.64	0.00	0.9871	0.0129	0.0001
612.98	0.64	0.00	0.9872	0.0128	0.0001
612.97	0.64	0.00	0.9873	0.0127	0.0001
612.96	0.64	0.00	0.9875	0.0125	0.0001
612.95	0.64	0.00	0.9876	0.0124	0.0001
612.94	0.63	0.00	0.9877	0.0123	0.0001
612.93	0.63	0.00	0.9878	0.0122	0.0001
612.92	0.63	0.00	0.9880	0.0120	0.0001
612.91	0.63	0.00	0.9881	0.0119	0.0001
612.90	0.63	0.00	0.9882	0.0118	0.0001
612.89	0.62	0.00	0.9883	0.0117	0.0001

612.88	0.62	0.00	0.9884	0.0116	0.0001
612.87	0.62	0.00	0.9885	0.0115	0.0001
612.86	0.62	0.00	0.9886	0.0114	0.0000
612.85	0.61	0.00	0.9888	0.0112	0.0000
612.84	0.61	0.00	0.9889	0.0111	0.0000
612.83	0.61	0.00	0.9890	0.0110	0.0000
612.82	0.61	0.00	0.9891	0.0109	0.0000
612.81	0.61	0.00	0.9892	0.0108	0.0000
612.80	0.60	0.00	0.9893	0.0107	0.0000
612.79	0.60	0.00	0.9894	0.0106	0.0000
612.78	0.60	0.00	0.9895	0.0105	0.0000
612.77	0.60	0.00	0.9896	0.0104	0.0000
612.76	0.60	0.00	0.9898	0.0102	0.0000
612.75	0.59	0.00	0.9899	0.0101	0.0000
612.74	0.59	0.00	0.9900	0.0100	0.0000
612.73	0.59	0.00	0.9901	0.0099	0.0000
612.72	0.59	0.00	0.9902	0.0098	0.0000
612.71	0.59	0.00	0.9903	0.0097	0.0000
612.70	0.58	0.00	0.9904	0.0096	0.0000
612.69	0.58	0.00	0.9905	0.0095	0.0000
612.68	0.58	0.00	0.9906	0.0094	0.0000
612.67	0.58	0.00	0.9907	0.0093	0.0000
612.66	0.58	0.00	0.9908	0.0092	0.0000
612.65	0.57	0.00	0.9909	0.0091	0.0000
612.64	0.57	0.00	0.9910	0.0090	0.0000
612.63	0.57	0.00	0.9911	0.0089	0.0000
612.62	0.57	0.00	0.9912	0.0088	0.0000
612.61	0.56	0.00	0.9913	0.0087	0.0000
612.60	0.56	0.00	0.9914	0.0086	0.0000
612.59	0.56	0.00	0.9915	0.0085	0.0000
612.58	0.56	0.00	0.9916	0.0084	0.0000
612.57	0.56	0.00	0.9917	0.0083	0.0000
612.56	0.55	0.00	0.9917	0.0083	0.0000
612.55	0.55	0.00	0.9918	0.0082	0.0000
612.54	0.55	0.00	0.9919	0.0081	0.0000
612.53	0.55	0.00	0.9920	0.0080	0.0000
612.52	0.55	0.00	0.9921	0.0079	0.0000
612.51	0.54	0.00	0.9922	0.0078	0.0000
612.50	0.54	0.00	0.9923	0.0077	0.0000
612.49	0.54	0.00	0.9924	0.0076	0.0000
612.48	0.54	0.00	0.9925	0.0075	0.0000
612.47	0.54	0.00	0.9926	0.0074	0.0000
612.46	0.53	0.00	0.9926	0.0074	0.0000
612.45	0.53	0.00	0.9927	0.0073	0.0000
612.44	0.53	0.00	0.9928	0.0072	0.0000
612.43	0.53	0.00	0.9929	0.0071	0.0000
612.42	0.52	0.00	0.9930	0.0070	0.0000
612.41	0.52	0.00	0.9931	0.0069	0.0000
612.40	0.52	0.00	0.9931	0.0069	0.0000
612.39	0.52	0.00	0.9932	0.0068	0.0000
612.38	0.52	0.00	0.9933	0.0067	0.0000
612.37	0.51	0.00	0.9934	0.0066	0.0000
612.36	0.51	0.00	0.9935	0.0065	0.0000
612.35	0.51	0.00	0.9936	0.0064	0.0000
612.34	0.51	0.00	0.9936	0.0064	0.0000
612.33	0.51	0.00	0.9937	0.0063	0.0000
612.32	0.50	0.00	0.9938	0.0062	0.0000
612.31	0.50	0.00	0.9939	0.0061	0.0000
612.30	0.50	0.00	0.9939	0.0061	0.0000
612.29	0.50	0.00	0.9940	0.0060	0.0000
612.28	0.50	0.00	0.9941	0.0059	0.0000
612.27	0.49	0.00	0.9942	0.0058	0.0000
612.26	0.49	0.00	0.9942	0.0058	0.0000
612.25	0.49	0.00	0.9943	0.0057	0.0000
612.24	0.49	0.00	0.9944	0.0056	0.0000
612.23	0.48	0.00	0.9945	0.0055	0.0000
612.22	0.48	0.00	0.9945	0.0055	0.0000
612.21	0.48	0.00	0.9946	0.0054	0.0000
612.20	0.48	0.00	0.9947	0.0053	0.0000
612.19	0.48	0.00	0.9947	0.0053	0.0000
612.18	0.47	0.00	0.9948	0.0052	0.0000
612.17	0.47	0.00	0.9949	0.0051	0.0000
612.16	0.47	0.00	0.9949	0.0051	0.0000
612.15	0.47	0.00	0.9950	0.0050	0.0000
612.14	0.47	0.00	0.9951	0.0049	0.0000
612.13	0.46	0.00	0.9951	0.0049	0.0000
612.12	0.46	0.00	0.9952	0.0048	0.0000
612.11	0.46	0.00	0.9953	0.0047	0.0000
612.10	0.46	0.00	0.9953	0.0047	0.0000

612.09	0.46	0.00	0.9954	0.0046	0.0000
612.08	0.45	0.00	0.9955	0.0045	0.0000
612.07	0.45	0.00	0.9955	0.0045	0.0000
612.06	0.45	0.00	0.9956	0.0044	0.0000
612.05	0.45	0.00	0.9956	0.0044	0.0000
612.04	0.45	0.00	0.9957	0.0043	0.0000
612.03	0.44	0.00	0.9958	0.0042	0.0000
612.02	0.44	0.00	0.9958	0.0042	0.0000
612.01	0.44	0.00	0.9959	0.0041	0.0000
612.00	0.44	0.00	0.9959	0.0041	0.0000
611.99	0.43	0.00	0.9960	0.0040	0.0000
611.98	0.43	0.00	0.9961	0.0039	0.0000
611.97	0.43	0.00	0.9961	0.0039	0.0000
611.96	0.43	0.00	0.9962	0.0038	0.0000
611.95	0.43	0.00	0.9962	0.0038	0.0000
611.94	0.42	0.00	0.9963	0.0037	0.0000
611.93	0.42	0.00	0.9963	0.0037	0.0000
611.92	0.42	0.00	0.9964	0.0036	0.0000
611.91	0.42	0.00	0.9964	0.0036	0.0000
611.90	0.42	0.00	0.9965	0.0035	0.0000
611.89	0.41	0.00	0.9966	0.0034	0.0000
611.88	0.41	0.00	0.9966	0.0034	0.0000
611.87	0.41	0.00	0.9967	0.0033	0.0000
611.86	0.41	0.00	0.9967	0.0033	0.0000
611.85	0.41	0.00	0.9968	0.0032	0.0000
611.84	0.40	0.00	0.9968	0.0032	0.0000
611.83	0.40	0.00	0.9969	0.0031	0.0000
611.82	0.40	0.00	0.9969	0.0031	0.0000
611.81	0.40	0.00	0.9970	0.0030	0.0000
611.80	0.39	0.00	0.9970	0.0030	0.0000
611.79	0.39	0.00	0.9970	0.0030	0.0000
611.78	0.39	0.00	0.9971	0.0029	0.0000
611.77	0.39	0.00	0.9971	0.0029	0.0000
611.76	0.39	0.00	0.9972	0.0028	0.0000
611.75	0.38	0.00	0.9972	0.0028	0.0000
611.74	0.38	0.00	0.9973	0.0027	0.0000
611.73	0.38	0.00	0.9973	0.0027	0.0000
611.72	0.38	0.00	0.9974	0.0026	0.0000
611.71	0.38	0.00	0.9974	0.0026	0.0000
611.70	0.37	0.00	0.9975	0.0025	0.0000
611.69	0.37	0.00	0.9975	0.0025	0.0000
611.68	0.37	0.00	0.9975	0.0025	0.0000
611.67	0.37	0.00	0.9976	0.0024	0.0000
611.66	0.37	0.00	0.9976	0.0024	0.0000
611.65	0.36	0.00	0.9977	0.0023	0.0000
611.64	0.36	0.00	0.9977	0.0023	0.0000
611.63	0.36	0.00	0.9977	0.0023	0.0000
611.62	0.36	0.00	0.9978	0.0022	0.0000
611.61	0.35	0.00	0.9978	0.0022	0.0000
611.60	0.35	0.00	0.9979	0.0021	0.0000
611.59	0.35	0.00	0.9979	0.0021	0.0000
611.58	0.35	0.00	0.9979	0.0021	0.0000
611.57	0.35	0.00	0.9980	0.0020	0.0000
611.56	0.34	0.00	0.9980	0.0020	0.0000
611.55	0.34	0.00	0.9980	0.0020	0.0000
611.54	0.34	0.00	0.9981	0.0019	0.0000
611.53	0.34	0.00	0.9981	0.0019	0.0000
611.52	0.34	0.00	0.9981	0.0019	0.0000
611.51	0.33	0.00	0.9982	0.0018	0.0000
611.50	0.33	0.00	0.9982	0.0018	0.0000
611.49	0.33	0.00	0.9983	0.0017	0.0000
611.48	0.33	0.00	0.9983	0.0017	0.0000
611.47	0.33	0.00	0.9983	0.0017	0.0000
611.46	0.32	0.00	0.9983	0.0017	0.0000
611.45	0.32	0.00	0.9984	0.0016	0.0000
611.44	0.32	0.00	0.9984	0.0016	0.0000
611.43	0.32	0.00	0.9984	0.0016	0.0000
611.42	0.32	0.00	0.9985	0.0015	0.0000
611.41	0.31	0.00	0.9985	0.0015	0.0000
611.40	0.31	0.00	0.9985	0.0015	0.0000
611.39	0.31	0.00	0.9986	0.0014	0.0000
611.38	0.31	0.00	0.9986	0.0014	0.0000
611.37	0.30	0.00	0.9986	0.0014	0.0000
611.36	0.30	0.00	0.9987	0.0013	0.0000
611.35	0.30	0.00	0.9987	0.0013	0.0000
611.34	0.30	0.00	0.9987	0.0013	0.0000
611.33	0.30	0.00	0.9987	0.0013	0.0000
611.32	0.29	0.00	0.9988	0.0012	0.0000
611.31	0.29	0.00	0.9988	0.0012	0.0000





610.51	0.12	0.00	0.9999	0.0001	0.0000
610.50	0.12	0.00	0.9999	0.0001	0.0000
610.49	0.12	0.00	0.9999	0.0001	0.0000
610.48	0.12	0.00	0.9999	0.0001	0.0000
610.47	0.12	0.00	0.9999	0.0001	0.0000
610.46	0.11	0.00	0.9999	0.0001	0.0000
610.45	0.11	0.00	0.9999	0.0001	0.0000
610.44	0.11	0.00	0.9999	0.0001	0.0000
610.43	0.11	0.00	0.9999	0.0001	0.0000
610.42	0.11	0.00	0.9999	0.0001	0.0000
610.41	0.10	0.00	0.9999	0.0001	0.0000
610.40	0.10	0.00	0.9999	0.0001	0.0000
610.39	0.10	0.00	1.0000	0.0000	0.0000
610.38	0.10	0.00	1.0000	0.0000	0.0000
610.37	0.09	0.00	1.0000	0.0000	0.0000
610.36	0.09	0.00	1.0000	0.0000	0.0000
610.35	0.09	0.00	1.0000	0.0000	0.0000
610.34	0.09	0.00	1.0000	0.0000	0.0000
610.33	0.09	0.00	1.0000	0.0000	0.0000
610.32	0.08	0.00	1.0000	0.0000	0.0000
610.31	0.08	0.00	1.0000	0.0000	0.0000
610.30	0.08	0.00	1.0000	0.0000	0.0000
610.29	0.08	0.00	1.0000	0.0000	0.0000
610.28	0.08	0.00	1.0000	0.0000	0.0000
610.27	0.07	0.00	1.0000	0.0000	0.0000
610.26	0.07	0.00	1.0000	0.0000	0.0000
610.25	0.07	0.00	1.0000	0.0000	0.0000
610.24	0.07	0.00	1.0000	0.0000	0.0000
610.23	0.07	0.00	1.0000	0.0000	0.0000
610.22	0.06	0.00	1.0000	0.0000	0.0000
610.21	0.06	0.00	1.0000	0.0000	0.0000
610.20	0.06	0.00	1.0000	0.0000	0.0000
610.19	0.06	0.00	1.0000	0.0000	0.0000
610.18	0.05	0.00	1.0000	0.0000	0.0000
610.17	0.05	0.00	1.0000	0.0000	0.0000
610.16	0.05	0.00	1.0000	0.0000	0.0000
610.15	0.05	0.00	1.0000	0.0000	0.0000
610.14	0.05	0.00	1.0000	0.0000	0.0000
610.13	0.04	0.00	1.0000	0.0000	0.0000
610.12	0.04	0.00	1.0000	0.0000	0.0000
610.11	0.04	0.00	1.0000	0.0000	0.0000
610.10	0.04	0.00	1.0000	0.0000	0.0000
610.09	0.04	0.00	1.0000	0.0000	0.0000
610.08	0.03	0.00	1.0000	0.0000	0.0000
610.07	0.03	0.00	1.0000	0.0000	0.0000
610.06	0.03	0.00	1.0000	0.0000	0.0000
610.05	0.03	0.00	1.0000	0.0000	0.0000
610.04	0.03	0.00	1.0000	0.0000	0.0000
610.03	0.02	0.00	1.0000	0.0000	0.0000
610.02	0.02	0.00	1.0000	0.0000	0.0000
610.01	0.02	0.00	1.0000	0.0000	0.0000
610.00	0.02	0.00	1.0000	0.0000	0.0000
609.99	0.02	0.00	1.0000	0.0000	0.0000
609.98	0.01	0.00	1.0000	0.0000	0.0000
609.97	0.01	0.00	1.0000	0.0000	0.0000
609.96	0.01	0.00	1.0000	0.0000	0.0000
609.95	0.01	0.00	1.0000	0.0000	0.0000
609.94	0.00	0.00	1.0000	0.0000	0.0000
609.93	0.00	0.00	1.0000	0.0000	0.0000
609.92	0.00	0.00	1.0000	0.0000	0.0000
Zow = 609.92	0.00	0.00	1.0000	0.0000	0.0000
			Oil Specific Volume	0.1880	ft <sup>3</sup> /ft <sup>2</sup>

Data Entry Worksheet for Soil Samples -- Oil Specific Volume (OSV) Calculations

Project No. = 406 [ ] = User must enter the soil or fluid parameter, or lab data, as appropriate  
Boring Designation = EW-5

Soil Parameters

Fluid Parameters

Oil Parameters

Required to Estimate OSV - Soil

Required to Estimate OSV - Soil

$\rho_b = 1.5 \text{ g/cm}^3$  Bulk density of soil

$\rho_o = 0.772 \text{ g/cm}^3$  Oil density

Soil Sample Data

Sample Intervals (maximum 21 samples)

	Feet (bgs)	to	Feet (bgs)	GRO or DRO (mg/kg)
1	[ ]		[ ]	[ ]
2	[ ]		[ ]	[ ]
3	[ ]		[ ]	[ ]
4	[ ]		[ ]	[ ]
5	[ ]		[ ]	[ ]
6	[ ]		[ ]	[ ]
7	[ ]		[ ]	[ ]
8	[ ]		[ ]	[ ]
9	[ ]		[ ]	[ ]
10	[ ]		[ ]	[ ]
11	[ ]		[ ]	[ ]
12	[ ]		[ ]	[ ]
13	[ ]		[ ]	[ ]
14	[ ]		[ ]	[ ]
15	[ ]		[ ]	[ ]
16	[ ]		[ ]	[ ]
17	[ ]		[ ]	[ ]
18	[ ]		[ ]	[ ]
19	[ ]		[ ]	[ ]
20	[ ]		[ ]	[ ]
21	[ ]		[ ]	[ ]

Deepest sample must be entered in this row

## Data Entry Worksheet for Monitoring Well Fluid Data -- Oil Specific Volume (OSV) Calculations

Project No. = 406  
Boring Designation = EW-5

= User must enter the soil or fluid parameter, or lab data, as appropriate

### Soil Parameters

#### Required to Estimate OSV - MWs

$\phi$  = 0.437 Total porosity  
 $\sigma_{ow}$  = 24.1 dynes/cm Oil/Water Interfacial Tension  
 $\sigma_{ao}$  = 22.6 dynes/cm Air/Oil Surface Tension  
 $\sigma_{aw}$  = 65.5 dynes/cm Air/Water Surface Tension  
 $\alpha$  = 0.125 /foot Van Genuchten mean pore-size parameter  
 $n$  = 3.00500 Van Genuchten pore-size distribution exponent  
 $S_m$  = 0.046 Irreducible water saturation

### Fluid Parameters

$\rho_{ro}$  = 0.772 Ratio of oil to water density  
 $\beta_{ao}$  = 2.90 Ratio of water surface tension to oil surface tension  
 $\beta_{ow}$  = 2.72 Ratio of water surface tension to oil-water interfacial tension  
 $Z_{ow}$  = 17.97 feet Depth to oil/air interface  
 $Z_{ao}$  = 18.24 feet Depth to oil/water interface  
 $S_m$  = 0.046 Water saturation at field capacity  
 $\alpha$  = 0.125 /foot Van Genuchten mean pore-size parameter  
 $n$  = 3.00500 Van Genuchten pore-size distribution exponent  
 $m$  = 0.334443 Calculated from "n" (Burdine)  
 $dZ$  = 0.01 feet Integration increment (0.01 to 1.0)  
TOC = 634.79 feet Elevation of TOC or measuring point

Oil Specific Volume Calculation Spreadsheet for Soil Samples

Project No. 406  
Boring Designation EW-5

Depth (feet)	dZ (feet)	GRO or DRO (mg/kg)	$\theta_o$ (-)	$V_o$ (ft <sup>3</sup> /ft <sup>2</sup> )
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000

Oil Specific Volume = 0.000

**DO NOT CHANGE ANY CELLS ON THIS WORKSHEET**













Data Entry Worksheet for Soil Samples -- Oil Specific Volume (OSV) Calculations

Project No. = 406 [ ] = User must enter the soil or fluid parameter, or lab data, as appropriate  
Boring Designation = EW-6

Soil Parameters

Fluid Parameters

Oil Parameters

Required to Estimate OSV - Soil

Required to Estimate OSV - Soil

$\rho_b$  = 1.6 g/cm<sup>3</sup> Bulk density of soil

$\rho_o$  = 0.7903 g/cm<sup>3</sup> Oil density

Soil Sample Data

Sample Intervals (maximum 21 samples)

	Feet (bgs)	to	Feet (bgs)	GRO or DRO (mg/kg)
1	[ ]		[ ]	[ ]
2	[ ]		[ ]	[ ]
3	[ ]		[ ]	[ ]
4	[ ]		[ ]	[ ]
5	[ ]		[ ]	[ ]
6	[ ]		[ ]	[ ]
7	[ ]		[ ]	[ ]
8	[ ]		[ ]	[ ]
9	[ ]		[ ]	[ ]
10	[ ]		[ ]	[ ]
11	[ ]		[ ]	[ ]
12	[ ]		[ ]	[ ]
13	[ ]		[ ]	[ ]
14	[ ]		[ ]	[ ]
15	[ ]		[ ]	[ ]
16	[ ]		[ ]	[ ]
17	[ ]		[ ]	[ ]
18	[ ]		[ ]	[ ]
19	[ ]		[ ]	[ ]
20	[ ]		[ ]	[ ]
21	[ ]		[ ]	[ ]

Deepest sample must be entered in this row

## Data Entry Worksheet for Monitoring Well Fluid Data -- Oil Specific Volume (OSV) Calculations

Project No. = 406  
Boring Designation = EW-6

= User must enter the soil or fluid parameter, or lab data, as appropriate

### Soil Parameters

#### Required to Estimate OSV - MWs

$\phi$  = 0.437 Total porosity  
 $\sigma_{ow}$  = 18.2 dynes/cm Oil/Water Interfacial Tension  
 $\sigma_{ao}$  = 22.7 dynes/cm Air/Oil Surface Tension  
 $\sigma_{aw}$  = 62.1 dynes/cm Air/Water Surface Tension  
 $\alpha$  = 0.125 /foot Van Genuchten mean pore-size parameter  
 $n$  = 3.00500 Van Genuchten pore-size distribution exponent  
 $S_m$  = 0.046 Irreducible water saturation

### Fluid Parameters

$\rho_{ro}$  = 0.7903 Ratio of oil to water density  
 $\beta_{ao}$  = 2.74 Ratio of water surface tension to oil surface tension  
 $\beta_{ow}$  = 3.41 Ratio of water surface tension to oil-water interfacial tension  
 $Z_{ow}$  = 23.22 feet Depth to oil/air interface  
 $Z_{ao}$  = 25.44 feet Depth to oil/water interface  
 $S_m$  = 0.046 Water saturation at field capacity  
 $\alpha$  = 0.125 /foot Van Genuchten mean pore-size parameter  
 $n$  = 3.00500 Van Genuchten pore-size distribution exponent  
 $m$  = 0.334443 Calculated from "n" (Burdine)  
 $dZ$  = 0.01 feet Integration increment (0.01 to 1.0)  
TOC = 639 feet Elevation of TOC or measuring point

Oil Specific Volume Calculation Spreadsheet for Soil Samples

Project No. 406  
Boring Designation EW-6

Depth (feet)	dZ (feet)	GRO or DRO (mg/kg)	$\theta_o$ (-)	$V_o$ (ft <sup>3</sup> /ft <sup>2</sup> )
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000

Oil Specific Volume = 0.000

**DO NOT CHANGE ANY CELLS ON THIS WORKSHEET**

Oil Specific Volume Calculation Spreadsheet for Free-phase Hydrocarbon in Monitoring Wells

Project No. 406  
Boring Designation EW-6

**DO NOT CHANGE ANY CELLS ON THIS WORKSHEET**

Z (feet)	h <sub>ow</sub> (feet)	h <sub>ao</sub> (feet)	S <sub>w</sub> (--)	S <sub>of</sub> (--)	φ S <sub>of</sub> dZ (ft <sup>3</sup> /ft <sup>2</sup> )
Z <sub>u</sub> = 616.88	0.70	0.87	0.9838	0.0000	0.0000
616.87	0.69	0.86	0.9840	0.0003	0.0000
616.86	0.69	0.85	0.9841	0.0006	0.0000
616.85	0.69	0.84	0.9842	0.0008	0.0000
616.84	0.69	0.84	0.9844	0.0011	0.0000
616.83	0.69	0.83	0.9845	0.0014	0.0000
616.82	0.68	0.82	0.9847	0.0016	0.0000
616.81	0.68	0.81	0.9848	0.0019	0.0000
616.80	0.68	0.80	0.9849	0.0021	0.0000
616.79	0.68	0.80	0.9851	0.0023	0.0000
616.78	0.67	0.79	0.9852	0.0026	0.0000
616.77	0.67	0.78	0.9853	0.0028	0.0000
616.76	0.67	0.77	0.9855	0.0030	0.0000
616.75	0.67	0.77	0.9856	0.0032	0.0000
616.74	0.67	0.76	0.9857	0.0034	0.0000
616.73	0.66	0.75	0.9859	0.0036	0.0000
616.72	0.66	0.74	0.9860	0.0038	0.0000
616.71	0.66	0.73	0.9861	0.0040	0.0000
616.70	0.66	0.73	0.9863	0.0042	0.0000
616.69	0.66	0.72	0.9864	0.0044	0.0000
616.68	0.65	0.71	0.9865	0.0045	0.0000
616.67	0.65	0.70	0.9867	0.0047	0.0000
616.66	0.65	0.69	0.9868	0.0049	0.0000
616.65	0.65	0.69	0.9869	0.0050	0.0000
616.64	0.65	0.68	0.9870	0.0052	0.0000
616.63	0.64	0.67	0.9872	0.0053	0.0000
616.62	0.64	0.66	0.9873	0.0055	0.0000
616.61	0.64	0.65	0.9874	0.0056	0.0000
616.60	0.64	0.65	0.9875	0.0057	0.0000
616.59	0.63	0.64	0.9876	0.0058	0.0000
616.58	0.63	0.63	0.9878	0.0060	0.0000
616.57	0.63	0.62	0.9879	0.0061	0.0000
616.56	0.63	0.61	0.9880	0.0062	0.0000
616.55	0.63	0.61	0.9881	0.0063	0.0000
616.54	0.62	0.60	0.9882	0.0064	0.0000
616.53	0.62	0.59	0.9884	0.0065	0.0000
616.52	0.62	0.58	0.9885	0.0066	0.0000
616.51	0.62	0.58	0.9886	0.0066	0.0000
616.50	0.62	0.57	0.9887	0.0067	0.0000
616.49	0.61	0.56	0.9888	0.0068	0.0000
616.48	0.61	0.55	0.9889	0.0069	0.0000
616.47	0.61	0.54	0.9890	0.0069	0.0000
616.46	0.61	0.54	0.9891	0.0070	0.0000
616.45	0.61	0.53	0.9893	0.0070	0.0000
616.44	0.60	0.52	0.9894	0.0071	0.0000
616.43	0.60	0.51	0.9895	0.0071	0.0000
616.42	0.60	0.50	0.9896	0.0072	0.0000
616.41	0.60	0.50	0.9897	0.0072	0.0000
616.40	0.60	0.49	0.9898	0.0073	0.0000
616.39	0.59	0.48	0.9899	0.0073	0.0000
616.38	0.59	0.47	0.9900	0.0073	0.0000
616.37	0.59	0.46	0.9901	0.0074	0.0000
616.36	0.59	0.46	0.9902	0.0074	0.0000
616.35	0.58	0.45	0.9903	0.0074	0.0000
616.34	0.58	0.44	0.9904	0.0074	0.0000
616.33	0.58	0.43	0.9905	0.0074	0.0000
616.32	0.58	0.43	0.9906	0.0074	0.0000
616.31	0.58	0.42	0.9907	0.0074	0.0000
616.30	0.57	0.41	0.9908	0.0074	0.0000
616.29	0.57	0.40	0.9909	0.0074	0.0000
616.28	0.57	0.39	0.9910	0.0074	0.0000
616.27	0.57	0.39	0.9911	0.0074	0.0000
616.26	0.57	0.38	0.9912	0.0074	0.0000
616.25	0.56	0.37	0.9913	0.0074	0.0000
616.24	0.56	0.36	0.9914	0.0074	0.0000
616.23	0.56	0.35	0.9915	0.0074	0.0000
616.22	0.56	0.35	0.9916	0.0074	0.0000

$$Z_u = \rho_{ro} \beta_{ao} H_o / [\rho_{ro} \beta_{ao} - (1 - \rho_{ro}) \beta_{ow}]$$

= 616.88 feet

where:

ρ<sub>ro</sub> = 0.7903

β<sub>ao</sub> = 2.74

β<sub>ow</sub> = 3.41

H<sub>o</sub> = 2.22 feet

Z<sub>ow</sub> = 613.56 feet

Z<sub>ao</sub> = 615.78 feet

Other parameters used in calculations (from Data Entry - MWs)

S<sub>m</sub> = 0.046

α = 0.125 /foot

n = 3.005

m = 0.334442596

dZ = 0.01 feet      Integration increment (0.01 to 1.0)

φ = 0.437

Oil Specific Volume

Σφ S<sub>of</sub> dZ = 3.9568E-03 ft<sup>3</sup>/ft<sup>2</sup>      Oil Specific Volume

616.21	0.56	0.34	0.9917	0.0073	0.0000
616.20	0.55	0.33	0.9918	0.0073	0.0000
616.19	0.55	0.32	0.9919	0.0073	0.0000
616.18	0.55	0.31	0.9920	0.0072	0.0000
616.17	0.55	0.31	0.9921	0.0072	0.0000
616.16	0.54	0.30	0.9922	0.0072	0.0000
616.15	0.54	0.29	0.9922	0.0071	0.0000
616.14	0.54	0.28	0.9923	0.0071	0.0000
616.13	0.54	0.28	0.9924	0.0071	0.0000
616.12	0.54	0.27	0.9925	0.0070	0.0000
616.11	0.53	0.26	0.9926	0.0070	0.0000
616.10	0.53	0.25	0.9927	0.0069	0.0000
616.09	0.53	0.24	0.9928	0.0069	0.0000
616.08	0.53	0.24	0.9928	0.0068	0.0000
616.07	0.53	0.23	0.9929	0.0068	0.0000
616.06	0.52	0.22	0.9930	0.0067	0.0000
616.05	0.52	0.21	0.9931	0.0067	0.0000
616.04	0.52	0.20	0.9932	0.0066	0.0000
616.03	0.52	0.20	0.9933	0.0065	0.0000
616.02	0.52	0.19	0.9933	0.0065	0.0000
616.01	0.51	0.18	0.9934	0.0064	0.0000
616.00	0.51	0.17	0.9935	0.0064	0.0000
615.99	0.51	0.16	0.9936	0.0063	0.0000
615.98	0.51	0.16	0.9937	0.0062	0.0000
615.97	0.50	0.15	0.9937	0.0062	0.0000
615.96	0.50	0.14	0.9938	0.0061	0.0000
615.95	0.50	0.13	0.9939	0.0060	0.0000
615.94	0.50	0.12	0.9940	0.0060	0.0000
615.93	0.50	0.12	0.9940	0.0059	0.0000
615.92	0.49	0.11	0.9941	0.0058	0.0000
615.91	0.49	0.10	0.9942	0.0058	0.0000
615.90	0.49	0.09	0.9943	0.0057	0.0000
615.89	0.49	0.09	0.9943	0.0056	0.0000
615.88	0.49	0.08	0.9944	0.0056	0.0000
615.87	0.48	0.07	0.9945	0.0055	0.0000
615.86	0.48	0.06	0.9946	0.0054	0.0000
615.85	0.48	0.05	0.9946	0.0054	0.0000
615.84	0.48	0.05	0.9947	0.0053	0.0000
615.83	0.48	0.04	0.9948	0.0052	0.0000
615.82	0.47	0.03	0.9948	0.0052	0.0000
615.81	0.47	0.02	0.9949	0.0051	0.0000
615.80	0.47	0.01	0.9950	0.0050	0.0000
615.79	0.47	0.01	0.9950	0.0050	0.0000
615.78	0.47	0.00	0.9951	0.0049	0.0000
615.77	0.46	0.00	0.9952	0.0048	0.0000
615.76	0.46	0.00	0.9952	0.0048	0.0000
615.75	0.46	0.00	0.9953	0.0047	0.0000
615.74	0.46	0.00	0.9954	0.0046	0.0000
615.73	0.45	0.00	0.9954	0.0046	0.0000
615.72	0.45	0.00	0.9955	0.0045	0.0000
615.71	0.45	0.00	0.9955	0.0045	0.0000
615.70	0.45	0.00	0.9956	0.0044	0.0000
615.69	0.45	0.00	0.9957	0.0043	0.0000
615.68	0.44	0.00	0.9957	0.0043	0.0000
615.67	0.44	0.00	0.9958	0.0042	0.0000
615.66	0.44	0.00	0.9959	0.0041	0.0000
615.65	0.44	0.00	0.9959	0.0041	0.0000
615.64	0.44	0.00	0.9960	0.0040	0.0000
615.63	0.43	0.00	0.9960	0.0040	0.0000
615.62	0.43	0.00	0.9961	0.0039	0.0000
615.61	0.43	0.00	0.9961	0.0039	0.0000
615.60	0.43	0.00	0.9962	0.0038	0.0000
615.59	0.43	0.00	0.9963	0.0037	0.0000
615.58	0.42	0.00	0.9963	0.0037	0.0000
615.57	0.42	0.00	0.9964	0.0036	0.0000
615.56	0.42	0.00	0.9964	0.0036	0.0000
615.55	0.42	0.00	0.9965	0.0035	0.0000
615.54	0.41	0.00	0.9965	0.0035	0.0000
615.53	0.41	0.00	0.9966	0.0034	0.0000
615.52	0.41	0.00	0.9966	0.0034	0.0000
615.51	0.41	0.00	0.9967	0.0033	0.0000
615.50	0.41	0.00	0.9967	0.0033	0.0000
615.49	0.40	0.00	0.9968	0.0032	0.0000
615.48	0.40	0.00	0.9968	0.0032	0.0000
615.47	0.40	0.00	0.9969	0.0031	0.0000
615.46	0.40	0.00	0.9969	0.0031	0.0000
615.45	0.40	0.00	0.9970	0.0030	0.0000
615.44	0.39	0.00	0.9970	0.0030	0.0000
615.43	0.39	0.00	0.9971	0.0029	0.0000

615.42	0.39	0.00	0.9971	0.0029	0.0000
615.41	0.39	0.00	0.9972	0.0028	0.0000
615.40	0.39	0.00	0.9972	0.0028	0.0000
615.39	0.38	0.00	0.9973	0.0027	0.0000
615.38	0.38	0.00	0.9973	0.0027	0.0000
615.37	0.38	0.00	0.9973	0.0027	0.0000
615.36	0.38	0.00	0.9974	0.0026	0.0000
615.35	0.37	0.00	0.9974	0.0026	0.0000
615.34	0.37	0.00	0.9975	0.0025	0.0000
615.33	0.37	0.00	0.9975	0.0025	0.0000
615.32	0.37	0.00	0.9976	0.0024	0.0000
615.31	0.37	0.00	0.9976	0.0024	0.0000
615.30	0.36	0.00	0.9976	0.0024	0.0000
615.29	0.36	0.00	0.9977	0.0023	0.0000
615.28	0.36	0.00	0.9977	0.0023	0.0000
615.27	0.36	0.00	0.9978	0.0022	0.0000
615.26	0.36	0.00	0.9978	0.0022	0.0000
615.25	0.35	0.00	0.9978	0.0022	0.0000
615.24	0.35	0.00	0.9979	0.0021	0.0000
615.23	0.35	0.00	0.9979	0.0021	0.0000
615.22	0.35	0.00	0.9979	0.0021	0.0000
615.21	0.35	0.00	0.9980	0.0020	0.0000
615.20	0.34	0.00	0.9980	0.0020	0.0000
615.19	0.34	0.00	0.9981	0.0019	0.0000
615.18	0.34	0.00	0.9981	0.0019	0.0000
615.17	0.34	0.00	0.9981	0.0019	0.0000
615.16	0.34	0.00	0.9982	0.0018	0.0000
615.15	0.33	0.00	0.9982	0.0018	0.0000
615.14	0.33	0.00	0.9982	0.0018	0.0000
615.13	0.33	0.00	0.9983	0.0017	0.0000
615.12	0.33	0.00	0.9983	0.0017	0.0000
615.11	0.32	0.00	0.9983	0.0017	0.0000
615.10	0.32	0.00	0.9984	0.0016	0.0000
615.09	0.32	0.00	0.9984	0.0016	0.0000
615.08	0.32	0.00	0.9984	0.0016	0.0000
615.07	0.32	0.00	0.9985	0.0015	0.0000
615.06	0.31	0.00	0.9985	0.0015	0.0000
615.05	0.31	0.00	0.9985	0.0015	0.0000
615.04	0.31	0.00	0.9985	0.0015	0.0000
615.03	0.31	0.00	0.9986	0.0014	0.0000
615.02	0.31	0.00	0.9986	0.0014	0.0000
615.01	0.30	0.00	0.9986	0.0014	0.0000
615.00	0.30	0.00	0.9987	0.0013	0.0000
614.99	0.30	0.00	0.9987	0.0013	0.0000
614.98	0.30	0.00	0.9987	0.0013	0.0000
614.97	0.30	0.00	0.9987	0.0013	0.0000
614.96	0.29	0.00	0.9988	0.0012	0.0000
614.95	0.29	0.00	0.9988	0.0012	0.0000
614.94	0.29	0.00	0.9988	0.0012	0.0000
614.93	0.29	0.00	0.9988	0.0012	0.0000
614.92	0.28	0.00	0.9989	0.0011	0.0000
614.91	0.28	0.00	0.9989	0.0011	0.0000
614.90	0.28	0.00	0.9989	0.0011	0.0000
614.89	0.28	0.00	0.9989	0.0011	0.0000
614.88	0.28	0.00	0.9990	0.0010	0.0000
614.87	0.27	0.00	0.9990	0.0010	0.0000
614.86	0.27	0.00	0.9990	0.0010	0.0000
614.85	0.27	0.00	0.9990	0.0010	0.0000
614.84	0.27	0.00	0.9991	0.0009	0.0000
614.83	0.27	0.00	0.9991	0.0009	0.0000
614.82	0.26	0.00	0.9991	0.0009	0.0000
614.81	0.26	0.00	0.9991	0.0009	0.0000
614.80	0.26	0.00	0.9991	0.0009	0.0000
614.79	0.26	0.00	0.9992	0.0008	0.0000
614.78	0.26	0.00	0.9992	0.0008	0.0000
614.77	0.25	0.00	0.9992	0.0008	0.0000
614.76	0.25	0.00	0.9992	0.0008	0.0000
614.75	0.25	0.00	0.9992	0.0008	0.0000
614.74	0.25	0.00	0.9993	0.0007	0.0000
614.73	0.24	0.00	0.9993	0.0007	0.0000
614.72	0.24	0.00	0.9993	0.0007	0.0000
614.71	0.24	0.00	0.9993	0.0007	0.0000
614.70	0.24	0.00	0.9993	0.0007	0.0000
614.69	0.24	0.00	0.9994	0.0006	0.0000
614.68	0.23	0.00	0.9994	0.0006	0.0000
614.67	0.23	0.00	0.9994	0.0006	0.0000
614.66	0.23	0.00	0.9994	0.0006	0.0000
614.65	0.23	0.00	0.9994	0.0006	0.0000
614.64	0.23	0.00	0.9994	0.0006	0.0000























Data Entry Worksheet for Soil Samples -- Oil Specific Volume (OSV) Calculations

Project No. = 406 [ ] = User must enter the soil or fluid parameter, or lab data, as appropriate  
Boring Designation = EW-7

Soil Parameters

Fluid Parameters

Oil Parameters

Required to Estimate OSV - Soil

Required to Estimate OSV - Soil

$\rho_b = 1.6 \text{ g/cm}^3$  Bulk density of soil

$\rho_o = 0.7903 \text{ g/cm}^3$  Oil density

Soil Sample Data

Sample Intervals (maximum 21 samples)

	Feet (bgs)	to	Feet (bgs)	GRO or DRO (mg/kg)
1	[ ]		[ ]	[ ]
2	[ ]		[ ]	[ ]
3	[ ]		[ ]	[ ]
4	[ ]		[ ]	[ ]
5	[ ]		[ ]	[ ]
6	[ ]		[ ]	[ ]
7	[ ]		[ ]	[ ]
8	[ ]		[ ]	[ ]
9	[ ]		[ ]	[ ]
10	[ ]		[ ]	[ ]
11	[ ]		[ ]	[ ]
12	[ ]		[ ]	[ ]
13	[ ]		[ ]	[ ]
14	[ ]		[ ]	[ ]
15	[ ]		[ ]	[ ]
16	[ ]		[ ]	[ ]
17	[ ]		[ ]	[ ]
18	[ ]		[ ]	[ ]
19	[ ]		[ ]	[ ]
20	[ ]		[ ]	[ ]
21	[ ]		[ ]	[ ]

Deepest sample must be entered in this row

Data Entry Worksheet for Monitoring Well Fluid Data -- Oil Specific Volume (OSV) Calculations

Project No. = 406  
Boring Designation = EW-7

[ ] = User must enter the soil or fluid parameter, or lab data, as appropriate

Soil Parameters

Required to Estimate OSV - MWs

$\phi$  = 0.437 Total porosity  
 $\sigma_{ow}$  = 18.2 dynes/cm Oil/Water Interfacial Tension  
 $\sigma_{ao}$  = 22.7 dynes/cm Air/Oil Surface Tension  
 $\sigma_{aw}$  = 62.1 dynes/cm Air/Water Surface Tension  
 $\alpha$  = 0.125 /foot Van Genuchten mean pore-size parameter  
 $n$  = 3.00500 Van Genuchten pore-size distribution exponent  
 $S_m$  = 0.046 Irreducible water saturation

Fluid Parameters

$\rho_{ro}$  = 0.7903 Ratio of oil to water density  
 $\beta_{ao}$  = 2.74 Ratio of water surface tension to oil surface tension  
 $\beta_{ow}$  = 3.41 Ratio of water surface tension to oil-water interfacial tension  
 $Z_{ow}$  = 21 feet Depth to oil/air interface  
 $Z_{ao}$  = 25.16 feet Depth to oil/water interface  
 $S_m$  = 0.046 Water saturation at field capacity  
 $\alpha$  = 0.125 /foot Van Genuchten mean pore-size parameter  
 $n$  = 3.00500 Van Genuchten pore-size distribution exponent  
 $m$  = 0.334443 Calculated from "n" (Burdine)  
 $dZ$  = 0.01 feet Integration increment (0.01 to 1.0)  
TOC = 637.2 feet Elevation of TOC or measuring point

Oil Specific Volume Calculation Spreadsheet for Soil Samples

Project No. 406  
Boring Designation EW-7

Depth (feet)	dZ (feet)	GRO or DRO (mg/kg)	$\theta_o$ (-)	$V_o$ (ft <sup>3</sup> /ft <sup>2</sup> )
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000

Oil Specific Volume = 0.000

**DO NOT CHANGE ANY CELLS ON THIS WORKSHEET**

Oil Specific Volume Calculation Spreadsheet for Free-phase Hydrocarbon in Monitoring Wells

Project No. 406  
Boring Designation EW-7

**DO NOT CHANGE ANY CELLS ON THIS WORKSHEET**

Z (feet)	h <sub>ow</sub> (feet)	h <sub>ao</sub> (feet)	S <sub>w</sub> (--)	S <sub>of</sub> (--)	φ S <sub>of</sub> dZ (ft <sup>3</sup> /ft <sup>2</sup> )
Z <sub>u</sub> = 618.26	1.30	1.63	0.9044	0.0000	0.0000
618.25	1.30	1.62	0.9048	0.0008	0.0000
618.24	1.30	1.61	0.9052	0.0016	0.0000
618.23	1.30	1.60	0.9056	0.0024	0.0000
618.22	1.30	1.59	0.9060	0.0032	0.0000
618.21	1.29	1.59	0.9064	0.0040	0.0000
618.20	1.29	1.58	0.9068	0.0048	0.0000
618.19	1.29	1.57	0.9072	0.0056	0.0000
618.18	1.29	1.56	0.9076	0.0063	0.0000
618.17	1.28	1.56	0.9080	0.0071	0.0000
618.16	1.28	1.55	0.9084	0.0078	0.0000
618.15	1.28	1.54	0.9088	0.0086	0.0000
618.14	1.28	1.53	0.9092	0.0093	0.0000
618.13	1.28	1.52	0.9096	0.0101	0.0000
618.12	1.27	1.52	0.9100	0.0108	0.0000
618.11	1.27	1.51	0.9104	0.0115	0.0001
618.10	1.27	1.50	0.9108	0.0122	0.0001
618.09	1.27	1.49	0.9112	0.0129	0.0001
618.08	1.27	1.48	0.9116	0.0136	0.0001
618.07	1.26	1.48	0.9119	0.0143	0.0001
618.06	1.26	1.47	0.9123	0.0150	0.0001
618.05	1.26	1.46	0.9127	0.0157	0.0001
618.04	1.26	1.45	0.9131	0.0163	0.0001
618.03	1.26	1.44	0.9135	0.0170	0.0001
618.02	1.25	1.44	0.9139	0.0176	0.0001
618.01	1.25	1.43	0.9143	0.0183	0.0001
618.00	1.25	1.42	0.9146	0.0189	0.0001
617.99	1.25	1.41	0.9150	0.0195	0.0001
617.98	1.25	1.40	0.9154	0.0202	0.0001
617.97	1.24	1.40	0.9158	0.0208	0.0001
617.96	1.24	1.39	0.9162	0.0214	0.0001
617.95	1.24	1.38	0.9165	0.0220	0.0001
617.94	1.24	1.37	0.9169	0.0226	0.0001
617.93	1.23	1.37	0.9173	0.0231	0.0001
617.92	1.23	1.36	0.9177	0.0237	0.0001
617.91	1.23	1.35	0.9181	0.0243	0.0001
617.90	1.23	1.34	0.9184	0.0249	0.0001
617.89	1.23	1.33	0.9188	0.0254	0.0001
617.88	1.22	1.33	0.9192	0.0259	0.0001
617.87	1.22	1.32	0.9196	0.0265	0.0001
617.86	1.22	1.31	0.9199	0.0270	0.0001
617.85	1.22	1.30	0.9203	0.0275	0.0001
617.84	1.22	1.29	0.9207	0.0280	0.0001
617.83	1.21	1.29	0.9210	0.0286	0.0001
617.82	1.21	1.28	0.9214	0.0290	0.0001
617.81	1.21	1.27	0.9218	0.0295	0.0001
617.80	1.21	1.26	0.9221	0.0300	0.0001
617.79	1.21	1.25	0.9225	0.0305	0.0001
617.78	1.20	1.25	0.9229	0.0310	0.0001
617.77	1.20	1.24	0.9232	0.0314	0.0001
617.76	1.20	1.23	0.9236	0.0319	0.0001
617.75	1.20	1.22	0.9239	0.0323	0.0001
617.74	1.19	1.22	0.9243	0.0328	0.0001
617.73	1.19	1.21	0.9247	0.0332	0.0001
617.72	1.19	1.20	0.9250	0.0336	0.0001
617.71	1.19	1.19	0.9254	0.0340	0.0001
617.70	1.19	1.18	0.9257	0.0344	0.0002
617.69	1.18	1.18	0.9261	0.0348	0.0002
617.68	1.18	1.17	0.9265	0.0352	0.0002
617.67	1.18	1.16	0.9268	0.0356	0.0002
617.66	1.18	1.15	0.9272	0.0360	0.0002
617.65	1.18	1.14	0.9275	0.0363	0.0002
617.64	1.17	1.14	0.9279	0.0367	0.0002
617.63	1.17	1.13	0.9282	0.0370	0.0002
617.62	1.17	1.12	0.9286	0.0374	0.0002
617.61	1.17	1.11	0.9289	0.0377	0.0002
617.60	1.17	1.10	0.9293	0.0381	0.0002

$$Z_u = \rho_{ro} \beta_{ao} H_o / [\rho_{ro} \beta_{ao} - (1 - \rho_{ro}) \beta_{ow}]$$

= 618.26 feet

where:

ρ<sub>ro</sub> = 0.7903

β<sub>ao</sub> = 2.74

β<sub>ow</sub> = 3.41

H<sub>o</sub> = 4.16 feet

Z<sub>ow</sub> = 612.04 feet

Z<sub>ao</sub> = 616.2 feet

Other parameters used in calculations (from Data Entry - MWs)

S<sub>m</sub> = 0.046

α = 0.125 /foot

n = 3.005

m = 0.334442596

dZ = 0.01 feet      Integration increment (0.01 to 1.0)

φ = 0.437

Oil Specific Volume

Σφ S<sub>of</sub> dZ = 4.5884E-02 ft<sup>3</sup>/ft<sup>2</sup>      Oil Specific Volume

617.59	1.16	1.10	0.9296	0.0384	0.0002
617.58	1.16	1.09	0.9300	0.0387	0.0002
617.57	1.16	1.08	0.9303	0.0390	0.0002
617.56	1.16	1.07	0.9306	0.0393	0.0002
617.55	1.15	1.07	0.9310	0.0396	0.0002
617.54	1.15	1.06	0.9313	0.0399	0.0002
617.53	1.15	1.05	0.9317	0.0401	0.0002
617.52	1.15	1.04	0.9320	0.0404	0.0002
617.51	1.15	1.03	0.9324	0.0407	0.0002
617.50	1.14	1.03	0.9327	0.0409	0.0002
617.49	1.14	1.02	0.9330	0.0412	0.0002
617.48	1.14	1.01	0.9334	0.0414	0.0002
617.47	1.14	1.00	0.9337	0.0417	0.0002
617.46	1.14	0.99	0.9340	0.0419	0.0002
617.45	1.13	0.99	0.9344	0.0421	0.0002
617.44	1.13	0.98	0.9347	0.0423	0.0002
617.43	1.13	0.97	0.9350	0.0425	0.0002
617.42	1.13	0.96	0.9354	0.0427	0.0002
617.41	1.13	0.95	0.9357	0.0429	0.0002
617.40	1.12	0.95	0.9360	0.0431	0.0002
617.39	1.12	0.94	0.9364	0.0433	0.0002
617.38	1.12	0.93	0.9367	0.0434	0.0002
617.37	1.12	0.92	0.9370	0.0436	0.0002
617.36	1.12	0.91	0.9373	0.0438	0.0002
617.35	1.11	0.91	0.9377	0.0439	0.0002
617.34	1.11	0.90	0.9380	0.0441	0.0002
617.33	1.11	0.89	0.9383	0.0442	0.0002
617.32	1.11	0.88	0.9386	0.0443	0.0002
617.31	1.10	0.88	0.9390	0.0444	0.0002
617.30	1.10	0.87	0.9393	0.0446	0.0002
617.29	1.10	0.86	0.9396	0.0447	0.0002
617.28	1.10	0.85	0.9399	0.0448	0.0002
617.27	1.10	0.84	0.9402	0.0449	0.0002
617.26	1.09	0.84	0.9405	0.0450	0.0002
617.25	1.09	0.83	0.9409	0.0450	0.0002
617.24	1.09	0.82	0.9412	0.0451	0.0002
617.23	1.09	0.81	0.9415	0.0452	0.0002
617.22	1.09	0.80	0.9418	0.0453	0.0002
617.21	1.08	0.80	0.9421	0.0453	0.0002
617.20	1.08	0.79	0.9424	0.0454	0.0002
617.19	1.08	0.78	0.9427	0.0454	0.0002
617.18	1.08	0.77	0.9430	0.0455	0.0002
617.17	1.08	0.76	0.9434	0.0455	0.0002
617.16	1.07	0.76	0.9437	0.0455	0.0002
617.15	1.07	0.75	0.9440	0.0456	0.0002
617.14	1.07	0.74	0.9443	0.0456	0.0002
617.13	1.07	0.73	0.9446	0.0456	0.0002
617.12	1.06	0.73	0.9449	0.0456	0.0002
617.11	1.06	0.72	0.9452	0.0456	0.0002
617.10	1.06	0.71	0.9455	0.0456	0.0002
617.09	1.06	0.70	0.9458	0.0456	0.0002
617.08	1.06	0.69	0.9461	0.0456	0.0002
617.07	1.05	0.69	0.9464	0.0456	0.0002
617.06	1.05	0.68	0.9467	0.0455	0.0002
617.05	1.05	0.67	0.9470	0.0455	0.0002
617.04	1.05	0.66	0.9473	0.0455	0.0002
617.03	1.05	0.65	0.9476	0.0454	0.0002
617.02	1.04	0.65	0.9479	0.0454	0.0002
617.01	1.04	0.64	0.9482	0.0453	0.0002
617.00	1.04	0.63	0.9484	0.0453	0.0002
616.99	1.04	0.62	0.9487	0.0452	0.0002
616.98	1.04	0.61	0.9490	0.0452	0.0002
616.97	1.03	0.61	0.9493	0.0451	0.0002
616.96	1.03	0.60	0.9496	0.0450	0.0002
616.95	1.03	0.59	0.9499	0.0449	0.0002
616.94	1.03	0.58	0.9502	0.0449	0.0002
616.93	1.02	0.58	0.9505	0.0448	0.0002
616.92	1.02	0.57	0.9507	0.0447	0.0002
616.91	1.02	0.56	0.9510	0.0446	0.0002
616.90	1.02	0.55	0.9513	0.0445	0.0002
616.89	1.02	0.54	0.9516	0.0444	0.0002
616.88	1.01	0.54	0.9519	0.0443	0.0002
616.87	1.01	0.53	0.9522	0.0442	0.0002
616.86	1.01	0.52	0.9524	0.0440	0.0002
616.85	1.01	0.51	0.9527	0.0439	0.0002
616.84	1.01	0.50	0.9530	0.0438	0.0002
616.83	1.00	0.50	0.9533	0.0437	0.0002
616.82	1.00	0.49	0.9535	0.0435	0.0002
616.81	1.00	0.48	0.9538	0.0434	0.0002

616.80	1.00	0.47	0.9541	0.0433	0.0002
616.79	1.00	0.46	0.9544	0.0431	0.0002
616.78	0.99	0.46	0.9546	0.0430	0.0002
616.77	0.99	0.45	0.9549	0.0428	0.0002
616.76	0.99	0.44	0.9552	0.0427	0.0002
616.75	0.99	0.43	0.9554	0.0425	0.0002
616.74	0.99	0.42	0.9557	0.0424	0.0002
616.73	0.98	0.42	0.9560	0.0422	0.0002
616.72	0.98	0.41	0.9562	0.0420	0.0002
616.71	0.98	0.40	0.9565	0.0419	0.0002
616.70	0.98	0.39	0.9568	0.0417	0.0002
616.69	0.97	0.39	0.9570	0.0415	0.0002
616.68	0.97	0.38	0.9573	0.0414	0.0002
616.67	0.97	0.37	0.9576	0.0412	0.0002
616.66	0.97	0.36	0.9578	0.0410	0.0002
616.65	0.97	0.35	0.9581	0.0408	0.0002
616.64	0.96	0.35	0.9583	0.0406	0.0002
616.63	0.96	0.34	0.9586	0.0404	0.0002
616.62	0.96	0.33	0.9588	0.0403	0.0002
616.61	0.96	0.32	0.9591	0.0401	0.0002
616.60	0.96	0.31	0.9594	0.0399	0.0002
616.59	0.95	0.31	0.9596	0.0397	0.0002
616.58	0.95	0.30	0.9599	0.0395	0.0002
616.57	0.95	0.29	0.9601	0.0393	0.0002
616.56	0.95	0.28	0.9604	0.0391	0.0002
616.55	0.95	0.27	0.9606	0.0389	0.0002
616.54	0.94	0.27	0.9609	0.0387	0.0002
616.53	0.94	0.26	0.9611	0.0385	0.0002
616.52	0.94	0.25	0.9614	0.0382	0.0002
616.51	0.94	0.24	0.9616	0.0380	0.0002
616.50	0.93	0.24	0.9618	0.0378	0.0002
616.49	0.93	0.23	0.9621	0.0376	0.0002
616.48	0.93	0.22	0.9623	0.0374	0.0002
616.47	0.93	0.21	0.9626	0.0372	0.0002
616.46	0.93	0.20	0.9628	0.0370	0.0002
616.45	0.92	0.20	0.9631	0.0368	0.0002
616.44	0.92	0.19	0.9633	0.0365	0.0002
616.43	0.92	0.18	0.9635	0.0363	0.0002
616.42	0.92	0.17	0.9638	0.0361	0.0002
616.41	0.92	0.16	0.9640	0.0359	0.0002
616.40	0.91	0.16	0.9642	0.0357	0.0002
616.39	0.91	0.15	0.9645	0.0354	0.0002
616.38	0.91	0.14	0.9647	0.0352	0.0002
616.37	0.91	0.13	0.9649	0.0350	0.0002
616.36	0.91	0.12	0.9652	0.0348	0.0002
616.35	0.90	0.12	0.9654	0.0346	0.0002
616.34	0.90	0.11	0.9656	0.0343	0.0002
616.33	0.90	0.10	0.9659	0.0341	0.0001
616.32	0.90	0.09	0.9661	0.0339	0.0001
616.31	0.89	0.09	0.9663	0.0337	0.0001
616.30	0.89	0.08	0.9665	0.0334	0.0001
616.29	0.89	0.07	0.9668	0.0332	0.0001
616.28	0.89	0.06	0.9670	0.0330	0.0001
616.27	0.89	0.05	0.9672	0.0328	0.0001
616.26	0.88	0.05	0.9674	0.0326	0.0001
616.25	0.88	0.04	0.9677	0.0323	0.0001
616.24	0.88	0.03	0.9679	0.0321	0.0001
616.23	0.88	0.02	0.9681	0.0319	0.0001
616.22	0.88	0.01	0.9683	0.0317	0.0001
616.21	0.87	0.01	0.9685	0.0315	0.0001
616.20	0.87	0.00	0.9688	0.0312	0.0001
616.19	0.87	0.00	0.9690	0.0310	0.0001
616.18	0.87	0.00	0.9692	0.0308	0.0001
616.17	0.87	0.00	0.9694	0.0306	0.0001
616.16	0.86	0.00	0.9696	0.0304	0.0001
616.15	0.86	0.00	0.9698	0.0302	0.0001
616.14	0.86	0.00	0.9700	0.0300	0.0001
616.13	0.86	0.00	0.9703	0.0297	0.0001
616.12	0.86	0.00	0.9705	0.0295	0.0001
616.11	0.85	0.00	0.9707	0.0293	0.0001
616.10	0.85	0.00	0.9709	0.0291	0.0001
616.09	0.85	0.00	0.9711	0.0289	0.0001
616.08	0.85	0.00	0.9713	0.0287	0.0001
616.07	0.84	0.00	0.9715	0.0285	0.0001
616.06	0.84	0.00	0.9717	0.0283	0.0001
616.05	0.84	0.00	0.9719	0.0281	0.0001
616.04	0.84	0.00	0.9721	0.0279	0.0001
616.03	0.84	0.00	0.9723	0.0277	0.0001
616.02	0.83	0.00	0.9725	0.0275	0.0001

616.01	0.83	0.00	0.9727	0.0273	0.0001
616.00	0.83	0.00	0.9729	0.0271	0.0001
615.99	0.83	0.00	0.9731	0.0269	0.0001
615.98	0.83	0.00	0.9733	0.0267	0.0001
615.97	0.82	0.00	0.9735	0.0265	0.0001
615.96	0.82	0.00	0.9737	0.0263	0.0001
615.95	0.82	0.00	0.9739	0.0261	0.0001
615.94	0.82	0.00	0.9741	0.0259	0.0001
615.93	0.82	0.00	0.9743	0.0257	0.0001
615.92	0.81	0.00	0.9745	0.0255	0.0001
615.91	0.81	0.00	0.9747	0.0253	0.0001
615.90	0.81	0.00	0.9748	0.0252	0.0001
615.89	0.81	0.00	0.9750	0.0250	0.0001
615.88	0.80	0.00	0.9752	0.0248	0.0001
615.87	0.80	0.00	0.9754	0.0246	0.0001
615.86	0.80	0.00	0.9756	0.0244	0.0001
615.85	0.80	0.00	0.9758	0.0242	0.0001
615.84	0.80	0.00	0.9760	0.0240	0.0001
615.83	0.79	0.00	0.9762	0.0238	0.0001
615.82	0.79	0.00	0.9763	0.0237	0.0001
615.81	0.79	0.00	0.9765	0.0235	0.0001
615.80	0.79	0.00	0.9767	0.0233	0.0001
615.79	0.79	0.00	0.9769	0.0231	0.0001
615.78	0.78	0.00	0.9771	0.0229	0.0001
615.77	0.78	0.00	0.9772	0.0228	0.0001
615.76	0.78	0.00	0.9774	0.0226	0.0001
615.75	0.78	0.00	0.9776	0.0224	0.0001
615.74	0.78	0.00	0.9778	0.0222	0.0001
615.73	0.77	0.00	0.9779	0.0221	0.0001
615.72	0.77	0.00	0.9781	0.0219	0.0001
615.71	0.77	0.00	0.9783	0.0217	0.0001
615.70	0.77	0.00	0.9785	0.0215	0.0001
615.69	0.76	0.00	0.9786	0.0214	0.0001
615.68	0.76	0.00	0.9788	0.0212	0.0001
615.67	0.76	0.00	0.9790	0.0210	0.0001
615.66	0.76	0.00	0.9791	0.0209	0.0001
615.65	0.76	0.00	0.9793	0.0207	0.0001
615.64	0.75	0.00	0.9795	0.0205	0.0001
615.63	0.75	0.00	0.9796	0.0204	0.0001
615.62	0.75	0.00	0.9798	0.0202	0.0001
615.61	0.75	0.00	0.9800	0.0200	0.0001
615.60	0.75	0.00	0.9801	0.0199	0.0001
615.59	0.74	0.00	0.9803	0.0197	0.0001
615.58	0.74	0.00	0.9805	0.0195	0.0001
615.57	0.74	0.00	0.9806	0.0194	0.0001
615.56	0.74	0.00	0.9808	0.0192	0.0001
615.55	0.74	0.00	0.9809	0.0191	0.0001
615.54	0.73	0.00	0.9811	0.0189	0.0001
615.53	0.73	0.00	0.9813	0.0187	0.0001
615.52	0.73	0.00	0.9814	0.0186	0.0001
615.51	0.73	0.00	0.9816	0.0184	0.0001
615.50	0.73	0.00	0.9817	0.0183	0.0001
615.49	0.72	0.00	0.9819	0.0181	0.0001
615.48	0.72	0.00	0.9820	0.0180	0.0001
615.47	0.72	0.00	0.9822	0.0178	0.0001
615.46	0.72	0.00	0.9823	0.0177	0.0001
615.45	0.71	0.00	0.9825	0.0175	0.0001
615.44	0.71	0.00	0.9826	0.0174	0.0001
615.43	0.71	0.00	0.9828	0.0172	0.0001
615.42	0.71	0.00	0.9829	0.0171	0.0001
615.41	0.71	0.00	0.9831	0.0169	0.0001
615.40	0.70	0.00	0.9832	0.0168	0.0001
615.39	0.70	0.00	0.9834	0.0166	0.0001
615.38	0.70	0.00	0.9835	0.0165	0.0001
615.37	0.70	0.00	0.9837	0.0163	0.0001
615.36	0.70	0.00	0.9838	0.0162	0.0001
615.35	0.69	0.00	0.9840	0.0160	0.0001
615.34	0.69	0.00	0.9841	0.0159	0.0001
615.33	0.69	0.00	0.9842	0.0158	0.0001
615.32	0.69	0.00	0.9844	0.0156	0.0001
615.31	0.69	0.00	0.9845	0.0155	0.0001
615.30	0.68	0.00	0.9847	0.0153	0.0001
615.29	0.68	0.00	0.9848	0.0152	0.0001
615.28	0.68	0.00	0.9849	0.0151	0.0001
615.27	0.68	0.00	0.9851	0.0149	0.0001
615.26	0.67	0.00	0.9852	0.0148	0.0001
615.25	0.67	0.00	0.9853	0.0147	0.0001
615.24	0.67	0.00	0.9855	0.0145	0.0001
615.23	0.67	0.00	0.9856	0.0144	0.0001



615.22	0.67	0.00	0.9857	0.0143	0.0001
615.21	0.66	0.00	0.9859	0.0141	0.0001
615.20	0.66	0.00	0.9860	0.0140	0.0001
615.19	0.66	0.00	0.9861	0.0139	0.0001
615.18	0.66	0.00	0.9863	0.0137	0.0001
615.17	0.66	0.00	0.9864	0.0136	0.0001
615.16	0.65	0.00	0.9865	0.0135	0.0001
615.15	0.65	0.00	0.9867	0.0133	0.0001
615.14	0.65	0.00	0.9868	0.0132	0.0001
615.13	0.65	0.00	0.9869	0.0131	0.0001
615.12	0.65	0.00	0.9870	0.0130	0.0001
615.11	0.64	0.00	0.9872	0.0128	0.0001
615.10	0.64	0.00	0.9873	0.0127	0.0001
615.09	0.64	0.00	0.9874	0.0126	0.0001
615.08	0.64	0.00	0.9875	0.0125	0.0001
615.07	0.63	0.00	0.9876	0.0124	0.0001
615.06	0.63	0.00	0.9878	0.0122	0.0001
615.05	0.63	0.00	0.9879	0.0121	0.0001
615.04	0.63	0.00	0.9880	0.0120	0.0001
615.03	0.63	0.00	0.9881	0.0119	0.0001
615.02	0.62	0.00	0.9882	0.0118	0.0001
615.01	0.62	0.00	0.9884	0.0116	0.0001
615.00	0.62	0.00	0.9885	0.0115	0.0001
614.99	0.62	0.00	0.9886	0.0114	0.0000
614.98	0.62	0.00	0.9887	0.0113	0.0000
614.97	0.61	0.00	0.9888	0.0112	0.0000
614.96	0.61	0.00	0.9889	0.0111	0.0000
614.95	0.61	0.00	0.9890	0.0110	0.0000
614.94	0.61	0.00	0.9891	0.0109	0.0000
614.93	0.61	0.00	0.9893	0.0107	0.0000
614.92	0.60	0.00	0.9894	0.0106	0.0000
614.91	0.60	0.00	0.9895	0.0105	0.0000
614.90	0.60	0.00	0.9896	0.0104	0.0000
614.89	0.60	0.00	0.9897	0.0103	0.0000
614.88	0.60	0.00	0.9898	0.0102	0.0000
614.87	0.59	0.00	0.9899	0.0101	0.0000
614.86	0.59	0.00	0.9900	0.0100	0.0000
614.85	0.59	0.00	0.9901	0.0099	0.0000
614.84	0.59	0.00	0.9902	0.0098	0.0000
614.83	0.58	0.00	0.9903	0.0097	0.0000
614.82	0.58	0.00	0.9904	0.0096	0.0000
614.81	0.58	0.00	0.9905	0.0095	0.0000
614.80	0.58	0.00	0.9906	0.0094	0.0000
614.79	0.58	0.00	0.9907	0.0093	0.0000
614.78	0.57	0.00	0.9908	0.0092	0.0000
614.77	0.57	0.00	0.9909	0.0091	0.0000
614.76	0.57	0.00	0.9910	0.0090	0.0000
614.75	0.57	0.00	0.9911	0.0089	0.0000
614.74	0.57	0.00	0.9912	0.0088	0.0000
614.73	0.56	0.00	0.9913	0.0087	0.0000
614.72	0.56	0.00	0.9914	0.0086	0.0000
614.71	0.56	0.00	0.9915	0.0085	0.0000
614.70	0.56	0.00	0.9916	0.0084	0.0000
614.69	0.56	0.00	0.9917	0.0083	0.0000
614.68	0.55	0.00	0.9918	0.0082	0.0000
614.67	0.55	0.00	0.9919	0.0081	0.0000
614.66	0.55	0.00	0.9920	0.0080	0.0000
614.65	0.55	0.00	0.9921	0.0079	0.0000
614.64	0.54	0.00	0.9922	0.0078	0.0000
614.63	0.54	0.00	0.9922	0.0078	0.0000
614.62	0.54	0.00	0.9923	0.0077	0.0000
614.61	0.54	0.00	0.9924	0.0076	0.0000
614.60	0.54	0.00	0.9925	0.0075	0.0000
614.59	0.53	0.00	0.9926	0.0074	0.0000
614.58	0.53	0.00	0.9927	0.0073	0.0000
614.57	0.53	0.00	0.9928	0.0072	0.0000
614.56	0.53	0.00	0.9929	0.0071	0.0000
614.55	0.53	0.00	0.9929	0.0071	0.0000
614.54	0.52	0.00	0.9930	0.0070	0.0000
614.53	0.52	0.00	0.9931	0.0069	0.0000
614.52	0.52	0.00	0.9932	0.0068	0.0000
614.51	0.52	0.00	0.9933	0.0067	0.0000
614.50	0.52	0.00	0.9933	0.0067	0.0000
614.49	0.51	0.00	0.9934	0.0066	0.0000
614.48	0.51	0.00	0.9935	0.0065	0.0000
614.47	0.51	0.00	0.9936	0.0064	0.0000
614.46	0.51	0.00	0.9937	0.0063	0.0000
614.45	0.50	0.00	0.9937	0.0063	0.0000
614.44	0.50	0.00	0.9938	0.0062	0.0000

614.43	0.50	0.00	0.9939	0.0061	0.0000
614.42	0.50	0.00	0.9940	0.0060	0.0000
614.41	0.50	0.00	0.9940	0.0060	0.0000
614.40	0.49	0.00	0.9941	0.0059	0.0000
614.39	0.49	0.00	0.9942	0.0058	0.0000
614.38	0.49	0.00	0.9943	0.0057	0.0000
614.37	0.49	0.00	0.9943	0.0057	0.0000
614.36	0.49	0.00	0.9944	0.0056	0.0000
614.35	0.48	0.00	0.9945	0.0055	0.0000
614.34	0.48	0.00	0.9946	0.0054	0.0000
614.33	0.48	0.00	0.9946	0.0054	0.0000
614.32	0.48	0.00	0.9947	0.0053	0.0000
614.31	0.48	0.00	0.9948	0.0052	0.0000
614.30	0.47	0.00	0.9948	0.0052	0.0000
614.29	0.47	0.00	0.9949	0.0051	0.0000
614.28	0.47	0.00	0.9950	0.0050	0.0000
614.27	0.47	0.00	0.9950	0.0050	0.0000
614.26	0.47	0.00	0.9951	0.0049	0.0000
614.25	0.46	0.00	0.9952	0.0048	0.0000
614.24	0.46	0.00	0.9952	0.0048	0.0000
614.23	0.46	0.00	0.9953	0.0047	0.0000
614.22	0.46	0.00	0.9954	0.0046	0.0000
614.21	0.45	0.00	0.9954	0.0046	0.0000
614.20	0.45	0.00	0.9955	0.0045	0.0000
614.19	0.45	0.00	0.9956	0.0044	0.0000
614.18	0.45	0.00	0.9956	0.0044	0.0000
614.17	0.45	0.00	0.9957	0.0043	0.0000
614.16	0.44	0.00	0.9957	0.0043	0.0000
614.15	0.44	0.00	0.9958	0.0042	0.0000
614.14	0.44	0.00	0.9959	0.0041	0.0000
614.13	0.44	0.00	0.9959	0.0041	0.0000
614.12	0.44	0.00	0.9960	0.0040	0.0000
614.11	0.43	0.00	0.9960	0.0040	0.0000
614.10	0.43	0.00	0.9961	0.0039	0.0000
614.09	0.43	0.00	0.9961	0.0039	0.0000
614.08	0.43	0.00	0.9962	0.0038	0.0000
614.07	0.43	0.00	0.9963	0.0037	0.0000
614.06	0.42	0.00	0.9963	0.0037	0.0000
614.05	0.42	0.00	0.9964	0.0036	0.0000
614.04	0.42	0.00	0.9964	0.0036	0.0000
614.03	0.42	0.00	0.9965	0.0035	0.0000
614.02	0.41	0.00	0.9965	0.0035	0.0000
614.01	0.41	0.00	0.9966	0.0034	0.0000
614.00	0.41	0.00	0.9966	0.0034	0.0000
613.99	0.41	0.00	0.9967	0.0033	0.0000
613.98	0.41	0.00	0.9967	0.0033	0.0000
613.97	0.40	0.00	0.9968	0.0032	0.0000
613.96	0.40	0.00	0.9968	0.0032	0.0000
613.95	0.40	0.00	0.9969	0.0031	0.0000
613.94	0.40	0.00	0.9969	0.0031	0.0000
613.93	0.40	0.00	0.9970	0.0030	0.0000
613.92	0.39	0.00	0.9970	0.0030	0.0000
613.91	0.39	0.00	0.9971	0.0029	0.0000
613.90	0.39	0.00	0.9971	0.0029	0.0000
613.89	0.39	0.00	0.9972	0.0028	0.0000
613.88	0.39	0.00	0.9972	0.0028	0.0000
613.87	0.38	0.00	0.9973	0.0027	0.0000
613.86	0.38	0.00	0.9973	0.0027	0.0000
613.85	0.38	0.00	0.9973	0.0027	0.0000
613.84	0.38	0.00	0.9974	0.0026	0.0000
613.83	0.37	0.00	0.9974	0.0026	0.0000
613.82	0.37	0.00	0.9975	0.0025	0.0000
613.81	0.37	0.00	0.9975	0.0025	0.0000
613.80	0.37	0.00	0.9976	0.0024	0.0000
613.79	0.37	0.00	0.9976	0.0024	0.0000
613.78	0.36	0.00	0.9976	0.0024	0.0000
613.77	0.36	0.00	0.9977	0.0023	0.0000
613.76	0.36	0.00	0.9977	0.0023	0.0000
613.75	0.36	0.00	0.9978	0.0022	0.0000
613.74	0.36	0.00	0.9978	0.0022	0.0000
613.73	0.35	0.00	0.9978	0.0022	0.0000
613.72	0.35	0.00	0.9979	0.0021	0.0000
613.71	0.35	0.00	0.9979	0.0021	0.0000
613.70	0.35	0.00	0.9980	0.0020	0.0000
613.69	0.35	0.00	0.9980	0.0020	0.0000
613.68	0.34	0.00	0.9980	0.0020	0.0000
613.67	0.34	0.00	0.9981	0.0019	0.0000
613.66	0.34	0.00	0.9981	0.0019	0.0000
613.65	0.34	0.00	0.9981	0.0019	0.0000















Data Entry Worksheet for Soil Samples -- Oil Specific Volume (OSV) Calculations

Project No. = 406 [ ] = User must enter the soil or fluid parameter, or lab data, as appropriate  
Boring Designation = EW-11

Soil Parameters

Fluid Parameters

Oil Parameters

Required to Estimate OSV - Soil

Required to Estimate OSV - Soil

$\rho_b = 1.6 \text{ g/cm}^3$  Bulk density of soil

$\rho_o = 0.7903 \text{ g/cm}^3$  Oil density

Soil Sample Data

Sample Intervals (maximum 21 samples)

	Feet (bgs)	to	Feet (bgs)	GRO or DRO (mg/kg)
1	[ ]		[ ]	[ ]
2	[ ]		[ ]	[ ]
3	[ ]		[ ]	[ ]
4	[ ]		[ ]	[ ]
5	[ ]		[ ]	[ ]
6	[ ]		[ ]	[ ]
7	[ ]		[ ]	[ ]
8	[ ]		[ ]	[ ]
9	[ ]		[ ]	[ ]
10	[ ]		[ ]	[ ]
11	[ ]		[ ]	[ ]
12	[ ]		[ ]	[ ]
13	[ ]		[ ]	[ ]
14	[ ]		[ ]	[ ]
15	[ ]		[ ]	[ ]
16	[ ]		[ ]	[ ]
17	[ ]		[ ]	[ ]
18	[ ]		[ ]	[ ]
19	[ ]		[ ]	[ ]
20	[ ]		[ ]	[ ]
21	[ ]		[ ]	[ ]

Deepest sample must be entered in this row

## Data Entry Worksheet for Monitoring Well Fluid Data -- Oil Specific Volume (OSV) Calculations

Project No. = 406  
Boring Designation = EW-11

= User must enter the soil or fluid parameter, or lab data, as appropriate

### Soil Parameters

#### Required to Estimate OSV - MWs

$\phi$  = 0.437 Total porosity  
 $\sigma_{ow}$  = 18.2 dynes/cm Oil/Water Interfacial Tension  
 $\sigma_{ao}$  = 22.7 dynes/cm Air/Oil Surface Tension  
 $\sigma_{aw}$  = 62.1 dynes/cm Air/Water Surface Tension  
 $\alpha$  = 0.125 /foot Van Genuchten mean pore-size parameter  
 $n$  = 3.00500 Van Genuchten pore-size distribution exponent  
 $S_m$  = 0.046 Irreducible water saturation

### Fluid Parameters

$\rho_{ro}$  = 0.7903 Ratio of oil to water density  
 $\beta_{ao}$  = 2.74 Ratio of water surface tension to oil surface tension  
 $\beta_{ow}$  = 3.41 Ratio of water surface tension to oil-water interfacial tension  
 $Z_{ow}$  = 22.38 feet Depth to oil/air interface  
 $Z_{ao}$  = 25.78 feet Depth to oil/water interface  
 $S_m$  = 0.046 Water saturation at field capacity  
 $\alpha$  = 0.125 /foot Van Genuchten mean pore-size parameter  
 $n$  = 3.00500 Van Genuchten pore-size distribution exponent  
 $m$  = 0.334443 Calculated from "n" (Burdine)  
 $dZ$  = 0.01 feet Integration increment (0.01 to 1.0)  
TOC = 639.14 feet Elevation of TOC or measuring point



Oil Specific Volume Calculation Spreadsheet for Free-phase Hydrocarbon in Monitoring Wells

Project No. 406  
Boring Designation EW-11

**DO NOT CHANGE ANY CELLS ON THIS WORKSHEET**

Z (feet)	h <sub>ow</sub> (feet)	h <sub>ao</sub> (feet)	S <sub>w</sub> (--)	S <sub>of</sub> (--)	φ S <sub>of</sub> dZ (ft <sup>3</sup> /ft <sup>2</sup> )
Z <sub>u</sub> = 618.44	1.07	1.33	0.9448	0.0000	0.0000
618.43	1.06	1.32	0.9451	0.0006	0.0000
618.42	1.06	1.31	0.9454	0.0012	0.0000
618.41	1.06	1.31	0.9457	0.0018	0.0000
618.40	1.06	1.30	0.9460	0.0024	0.0000
618.39	1.06	1.29	0.9463	0.0030	0.0000
618.38	1.05	1.28	0.9466	0.0035	0.0000
618.37	1.05	1.27	0.9469	0.0041	0.0000
618.36	1.05	1.27	0.9471	0.0047	0.0000
618.35	1.05	1.26	0.9474	0.0052	0.0000
618.34	1.04	1.25	0.9477	0.0057	0.0000
618.33	1.04	1.24	0.9480	0.0063	0.0000
618.32	1.04	1.23	0.9483	0.0068	0.0000
618.31	1.04	1.23	0.9486	0.0073	0.0000
618.30	1.04	1.22	0.9489	0.0078	0.0000
618.29	1.03	1.21	0.9492	0.0083	0.0000
618.28	1.03	1.20	0.9495	0.0088	0.0000
618.27	1.03	1.19	0.9498	0.0093	0.0000
618.26	1.03	1.19	0.9501	0.0098	0.0000
618.25	1.03	1.18	0.9503	0.0103	0.0000
618.24	1.02	1.17	0.9506	0.0107	0.0000
618.23	1.02	1.16	0.9509	0.0112	0.0000
618.22	1.02	1.16	0.9512	0.0116	0.0001
618.21	1.02	1.15	0.9515	0.0121	0.0001
618.20	1.02	1.14	0.9518	0.0125	0.0001
618.19	1.01	1.13	0.9520	0.0129	0.0001
618.18	1.01	1.12	0.9523	0.0134	0.0001
618.17	1.01	1.12	0.9526	0.0138	0.0001
618.16	1.01	1.11	0.9529	0.0142	0.0001
618.15	1.00	1.10	0.9532	0.0146	0.0001
618.14	1.00	1.09	0.9534	0.0149	0.0001
618.13	1.00	1.08	0.9537	0.0153	0.0001
618.12	1.00	1.08	0.9540	0.0157	0.0001
618.11	1.00	1.07	0.9542	0.0161	0.0001
618.10	0.99	1.06	0.9545	0.0164	0.0001
618.09	0.99	1.05	0.9548	0.0168	0.0001
618.08	0.99	1.04	0.9551	0.0171	0.0001
618.07	0.99	1.04	0.9553	0.0175	0.0001
618.06	0.99	1.03	0.9556	0.0178	0.0001
618.05	0.98	1.02	0.9559	0.0181	0.0001
618.04	0.98	1.01	0.9561	0.0184	0.0001
618.03	0.98	1.01	0.9564	0.0187	0.0001
618.02	0.98	1.00	0.9567	0.0190	0.0001
618.01	0.98	0.99	0.9569	0.0193	0.0001
618.00	0.97	0.98	0.9572	0.0196	0.0001
617.99	0.97	0.97	0.9574	0.0199	0.0001
617.98	0.97	0.97	0.9577	0.0202	0.0001
617.97	0.97	0.96	0.9580	0.0204	0.0001
617.96	0.97	0.95	0.9582	0.0207	0.0001
617.95	0.96	0.94	0.9585	0.0209	0.0001
617.94	0.96	0.93	0.9587	0.0212	0.0001
617.93	0.96	0.93	0.9590	0.0214	0.0001
617.92	0.96	0.92	0.9592	0.0217	0.0001
617.91	0.95	0.91	0.9595	0.0219	0.0001
617.90	0.95	0.90	0.9598	0.0221	0.0001
617.89	0.95	0.89	0.9600	0.0223	0.0001
617.88	0.95	0.89	0.9603	0.0225	0.0001
617.87	0.95	0.88	0.9605	0.0227	0.0001
617.86	0.94	0.87	0.9608	0.0229	0.0001
617.85	0.94	0.86	0.9610	0.0231	0.0001
617.84	0.94	0.85	0.9613	0.0233	0.0001
617.83	0.94	0.85	0.9615	0.0234	0.0001
617.82	0.94	0.84	0.9617	0.0236	0.0001
617.81	0.93	0.83	0.9620	0.0238	0.0001
617.80	0.93	0.82	0.9622	0.0239	0.0001
617.79	0.93	0.82	0.9625	0.0241	0.0001
617.78	0.93	0.81	0.9627	0.0242	0.0001

$$Z_u = \rho_{ro} \beta_{ao} H_o / [\rho_{ro} \beta_{ao} - (1 - \rho_{ro}) \beta_{ow}]$$

= 618.44 feet

where:

ρ<sub>ro</sub> = 0.7903

β<sub>ao</sub> = 2.74

β<sub>ow</sub> = 3.41

H<sub>o</sub> = 3.4 feet

Z<sub>ow</sub> = 613.36 feet

Z<sub>ao</sub> = 616.76 feet

Other parameters used in calculations (from Data Entry - MWs)

S<sub>m</sub> = 0.046

α = 0.125 /foot

n = 3.005

m = 0.334442596

dZ = 0.01 feet Integration increment (0.01 to 1.0)

φ = 0.437

Oil Specific Volume

Σφ S<sub>of</sub> dZ = 2.1155E-02 ft<sup>3</sup>/ft<sup>2</sup> Oil Specific Volume

617.77	0.93	0.80	0.9630	0.0243	0.0001
617.76	0.92	0.79	0.9632	0.0245	0.0001
617.75	0.92	0.78	0.9634	0.0246	0.0001
617.74	0.92	0.78	0.9637	0.0247	0.0001
617.73	0.92	0.77	0.9639	0.0248	0.0001
617.72	0.91	0.76	0.9641	0.0249	0.0001
617.71	0.91	0.75	0.9644	0.0250	0.0001
617.70	0.91	0.74	0.9646	0.0251	0.0001
617.69	0.91	0.74	0.9648	0.0252	0.0001
617.68	0.91	0.73	0.9651	0.0253	0.0001
617.67	0.90	0.72	0.9653	0.0253	0.0001
617.66	0.90	0.71	0.9655	0.0254	0.0001
617.65	0.90	0.70	0.9658	0.0255	0.0001
617.64	0.90	0.70	0.9660	0.0255	0.0001
617.63	0.90	0.69	0.9662	0.0256	0.0001
617.62	0.89	0.68	0.9665	0.0256	0.0001
617.61	0.89	0.67	0.9667	0.0257	0.0001
617.60	0.89	0.67	0.9669	0.0257	0.0001
617.59	0.89	0.66	0.9671	0.0258	0.0001
617.58	0.89	0.65	0.9674	0.0258	0.0001
617.57	0.88	0.64	0.9676	0.0258	0.0001
617.56	0.88	0.63	0.9678	0.0258	0.0001
617.55	0.88	0.63	0.9680	0.0258	0.0001
617.54	0.88	0.62	0.9682	0.0259	0.0001
617.53	0.87	0.61	0.9685	0.0259	0.0001
617.52	0.87	0.60	0.9687	0.0259	0.0001
617.51	0.87	0.59	0.9689	0.0259	0.0001
617.50	0.87	0.59	0.9691	0.0258	0.0001
617.49	0.87	0.58	0.9693	0.0258	0.0001
617.48	0.86	0.57	0.9695	0.0258	0.0001
617.47	0.86	0.56	0.9697	0.0258	0.0001
617.46	0.86	0.55	0.9700	0.0258	0.0001
617.45	0.86	0.55	0.9702	0.0257	0.0001
617.44	0.86	0.54	0.9704	0.0257	0.0001
617.43	0.85	0.53	0.9706	0.0257	0.0001
617.42	0.85	0.52	0.9708	0.0256	0.0001
617.41	0.85	0.52	0.9710	0.0256	0.0001
617.40	0.85	0.51	0.9712	0.0255	0.0001
617.39	0.85	0.50	0.9714	0.0255	0.0001
617.38	0.84	0.49	0.9716	0.0254	0.0001
617.37	0.84	0.48	0.9718	0.0253	0.0001
617.36	0.84	0.48	0.9720	0.0253	0.0001
617.35	0.84	0.47	0.9722	0.0252	0.0001
617.34	0.83	0.46	0.9724	0.0251	0.0001
617.33	0.83	0.45	0.9726	0.0251	0.0001
617.32	0.83	0.44	0.9728	0.0250	0.0001
617.31	0.83	0.44	0.9730	0.0249	0.0001
617.30	0.83	0.43	0.9732	0.0248	0.0001
617.29	0.82	0.42	0.9734	0.0247	0.0001
617.28	0.82	0.41	0.9736	0.0246	0.0001
617.27	0.82	0.40	0.9738	0.0245	0.0001
617.26	0.82	0.40	0.9740	0.0244	0.0001
617.25	0.82	0.39	0.9742	0.0243	0.0001
617.24	0.81	0.38	0.9744	0.0242	0.0001
617.23	0.81	0.37	0.9746	0.0241	0.0001
617.22	0.81	0.36	0.9748	0.0240	0.0001
617.21	0.81	0.36	0.9750	0.0239	0.0001
617.20	0.81	0.35	0.9751	0.0238	0.0001
617.19	0.80	0.34	0.9753	0.0237	0.0001
617.18	0.80	0.33	0.9755	0.0235	0.0001
617.17	0.80	0.33	0.9757	0.0234	0.0001
617.16	0.80	0.32	0.9759	0.0233	0.0001
617.15	0.80	0.31	0.9761	0.0232	0.0001
617.14	0.79	0.30	0.9763	0.0230	0.0001
617.13	0.79	0.29	0.9764	0.0229	0.0001
617.12	0.79	0.29	0.9766	0.0228	0.0001
617.11	0.79	0.28	0.9768	0.0227	0.0001
617.10	0.78	0.27	0.9770	0.0225	0.0001
617.09	0.78	0.26	0.9772	0.0224	0.0001
617.08	0.78	0.25	0.9773	0.0222	0.0001
617.07	0.78	0.25	0.9775	0.0221	0.0001
617.06	0.78	0.24	0.9777	0.0220	0.0001
617.05	0.77	0.23	0.9779	0.0218	0.0001
617.04	0.77	0.22	0.9780	0.0217	0.0001
617.03	0.77	0.21	0.9782	0.0215	0.0001
617.02	0.77	0.21	0.9784	0.0214	0.0001
617.01	0.77	0.20	0.9786	0.0212	0.0001
617.00	0.76	0.19	0.9787	0.0211	0.0001
616.99	0.76	0.18	0.9789	0.0209	0.0001

616.98	0.76	0.18	0.9791	0.0208	0.0001
616.97	0.76	0.17	0.9792	0.0206	0.0001
616.96	0.76	0.16	0.9794	0.0205	0.0001
616.95	0.75	0.15	0.9796	0.0203	0.0001
616.94	0.75	0.14	0.9797	0.0202	0.0001
616.93	0.75	0.14	0.9799	0.0200	0.0001
616.92	0.75	0.13	0.9801	0.0199	0.0001
616.91	0.74	0.12	0.9802	0.0197	0.0001
616.90	0.74	0.11	0.9804	0.0196	0.0001
616.89	0.74	0.10	0.9806	0.0194	0.0001
616.88	0.74	0.10	0.9807	0.0193	0.0001
616.87	0.74	0.09	0.9809	0.0191	0.0001
616.86	0.73	0.08	0.9810	0.0189	0.0001
616.85	0.73	0.07	0.9812	0.0188	0.0001
616.84	0.73	0.06	0.9814	0.0186	0.0001
616.83	0.73	0.06	0.9815	0.0185	0.0001
616.82	0.73	0.05	0.9817	0.0183	0.0001
616.81	0.72	0.04	0.9818	0.0182	0.0001
616.80	0.72	0.03	0.9820	0.0180	0.0001
616.79	0.72	0.03	0.9821	0.0179	0.0001
616.78	0.72	0.02	0.9823	0.0177	0.0001
616.77	0.72	0.01	0.9824	0.0176	0.0001
616.76	0.71	0.00	0.9826	0.0174	0.0001
616.75	0.71	0.00	0.9827	0.0173	0.0001
616.74	0.71	0.00	0.9829	0.0171	0.0001
616.73	0.71	0.00	0.9830	0.0170	0.0001
616.72	0.70	0.00	0.9832	0.0168	0.0001
616.71	0.70	0.00	0.9833	0.0167	0.0001
616.70	0.70	0.00	0.9835	0.0165	0.0001
616.69	0.70	0.00	0.9836	0.0164	0.0001
616.68	0.70	0.00	0.9838	0.0162	0.0001
616.67	0.69	0.00	0.9839	0.0161	0.0001
616.66	0.69	0.00	0.9840	0.0160	0.0001
616.65	0.69	0.00	0.9842	0.0158	0.0001
616.64	0.69	0.00	0.9843	0.0157	0.0001
616.63	0.69	0.00	0.9845	0.0155	0.0001
616.62	0.68	0.00	0.9846	0.0154	0.0001
616.61	0.68	0.00	0.9847	0.0153	0.0001
616.60	0.68	0.00	0.9849	0.0151	0.0001
616.59	0.68	0.00	0.9850	0.0150	0.0001
616.58	0.68	0.00	0.9852	0.0148	0.0001
616.57	0.67	0.00	0.9853	0.0147	0.0001
616.56	0.67	0.00	0.9854	0.0146	0.0001
616.55	0.67	0.00	0.9856	0.0144	0.0001
616.54	0.67	0.00	0.9857	0.0143	0.0001
616.53	0.67	0.00	0.9858	0.0142	0.0001
616.52	0.66	0.00	0.9860	0.0140	0.0001
616.51	0.66	0.00	0.9861	0.0139	0.0001
616.50	0.66	0.00	0.9862	0.0138	0.0001
616.49	0.66	0.00	0.9863	0.0137	0.0001
616.48	0.65	0.00	0.9865	0.0135	0.0001
616.47	0.65	0.00	0.9866	0.0134	0.0001
616.46	0.65	0.00	0.9867	0.0133	0.0001
616.45	0.65	0.00	0.9869	0.0131	0.0001
616.44	0.65	0.00	0.9870	0.0130	0.0001
616.43	0.64	0.00	0.9871	0.0129	0.0001
616.42	0.64	0.00	0.9872	0.0128	0.0001
616.41	0.64	0.00	0.9874	0.0126	0.0001
616.40	0.64	0.00	0.9875	0.0125	0.0001
616.39	0.64	0.00	0.9876	0.0124	0.0001
616.38	0.63	0.00	0.9877	0.0123	0.0001
616.37	0.63	0.00	0.9878	0.0122	0.0001
616.36	0.63	0.00	0.9880	0.0120	0.0001
616.35	0.63	0.00	0.9881	0.0119	0.0001
616.34	0.63	0.00	0.9882	0.0118	0.0001
616.33	0.62	0.00	0.9883	0.0117	0.0001
616.32	0.62	0.00	0.9884	0.0116	0.0001
616.31	0.62	0.00	0.9885	0.0115	0.0001
616.30	0.62	0.00	0.9887	0.0113	0.0000
616.29	0.61	0.00	0.9888	0.0112	0.0000
616.28	0.61	0.00	0.9889	0.0111	0.0000
616.27	0.61	0.00	0.9890	0.0110	0.0000
616.26	0.61	0.00	0.9891	0.0109	0.0000
616.25	0.61	0.00	0.9892	0.0108	0.0000
616.24	0.60	0.00	0.9893	0.0107	0.0000
616.23	0.60	0.00	0.9894	0.0106	0.0000
616.22	0.60	0.00	0.9895	0.0105	0.0000
616.21	0.60	0.00	0.9897	0.0103	0.0000
616.20	0.60	0.00	0.9898	0.0102	0.0000

616.19	0.59	0.00	0.9899	0.0101	0.0000
616.18	0.59	0.00	0.9900	0.0100	0.0000
616.17	0.59	0.00	0.9901	0.0099	0.0000
616.16	0.59	0.00	0.9902	0.0098	0.0000
616.15	0.59	0.00	0.9903	0.0097	0.0000
616.14	0.58	0.00	0.9904	0.0096	0.0000
616.13	0.58	0.00	0.9905	0.0095	0.0000
616.12	0.58	0.00	0.9906	0.0094	0.0000
616.11	0.58	0.00	0.9907	0.0093	0.0000
616.10	0.57	0.00	0.9908	0.0092	0.0000
616.09	0.57	0.00	0.9909	0.0091	0.0000
616.08	0.57	0.00	0.9910	0.0090	0.0000
616.07	0.57	0.00	0.9911	0.0089	0.0000
616.06	0.57	0.00	0.9912	0.0088	0.0000
616.05	0.56	0.00	0.9913	0.0087	0.0000
616.04	0.56	0.00	0.9914	0.0086	0.0000
616.03	0.56	0.00	0.9915	0.0085	0.0000
616.02	0.56	0.00	0.9916	0.0084	0.0000
616.01	0.56	0.00	0.9917	0.0083	0.0000
616.00	0.55	0.00	0.9918	0.0082	0.0000
615.99	0.55	0.00	0.9918	0.0082	0.0000
615.98	0.55	0.00	0.9919	0.0081	0.0000
615.97	0.55	0.00	0.9920	0.0080	0.0000
615.96	0.55	0.00	0.9921	0.0079	0.0000
615.95	0.54	0.00	0.9922	0.0078	0.0000
615.94	0.54	0.00	0.9923	0.0077	0.0000
615.93	0.54	0.00	0.9924	0.0076	0.0000
615.92	0.54	0.00	0.9925	0.0075	0.0000
615.91	0.54	0.00	0.9926	0.0074	0.0000
615.90	0.53	0.00	0.9926	0.0074	0.0000
615.89	0.53	0.00	0.9927	0.0073	0.0000
615.88	0.53	0.00	0.9928	0.0072	0.0000
615.87	0.53	0.00	0.9929	0.0071	0.0000
615.86	0.52	0.00	0.9930	0.0070	0.0000
615.85	0.52	0.00	0.9931	0.0069	0.0000
615.84	0.52	0.00	0.9932	0.0068	0.0000
615.83	0.52	0.00	0.9932	0.0068	0.0000
615.82	0.52	0.00	0.9933	0.0067	0.0000
615.81	0.51	0.00	0.9934	0.0066	0.0000
615.80	0.51	0.00	0.9935	0.0065	0.0000
615.79	0.51	0.00	0.9936	0.0064	0.0000
615.78	0.51	0.00	0.9936	0.0064	0.0000
615.77	0.51	0.00	0.9937	0.0063	0.0000
615.76	0.50	0.00	0.9938	0.0062	0.0000
615.75	0.50	0.00	0.9939	0.0061	0.0000
615.74	0.50	0.00	0.9939	0.0061	0.0000
615.73	0.50	0.00	0.9940	0.0060	0.0000
615.72	0.50	0.00	0.9941	0.0059	0.0000
615.71	0.49	0.00	0.9942	0.0058	0.0000
615.70	0.49	0.00	0.9942	0.0058	0.0000
615.69	0.49	0.00	0.9943	0.0057	0.0000
615.68	0.49	0.00	0.9944	0.0056	0.0000
615.67	0.48	0.00	0.9945	0.0055	0.0000
615.66	0.48	0.00	0.9945	0.0055	0.0000
615.65	0.48	0.00	0.9946	0.0054	0.0000
615.64	0.48	0.00	0.9947	0.0053	0.0000
615.63	0.48	0.00	0.9947	0.0053	0.0000
615.62	0.47	0.00	0.9948	0.0052	0.0000
615.61	0.47	0.00	0.9949	0.0051	0.0000
615.60	0.47	0.00	0.9949	0.0051	0.0000
615.59	0.47	0.00	0.9950	0.0050	0.0000
615.58	0.47	0.00	0.9951	0.0049	0.0000
615.57	0.46	0.00	0.9951	0.0049	0.0000
615.56	0.46	0.00	0.9952	0.0048	0.0000
615.55	0.46	0.00	0.9953	0.0047	0.0000
615.54	0.46	0.00	0.9953	0.0047	0.0000
615.53	0.46	0.00	0.9954	0.0046	0.0000
615.52	0.45	0.00	0.9955	0.0045	0.0000
615.51	0.45	0.00	0.9955	0.0045	0.0000
615.50	0.45	0.00	0.9956	0.0044	0.0000
615.49	0.45	0.00	0.9956	0.0044	0.0000
615.48	0.44	0.00	0.9957	0.0043	0.0000
615.47	0.44	0.00	0.9958	0.0042	0.0000
615.46	0.44	0.00	0.9958	0.0042	0.0000
615.45	0.44	0.00	0.9959	0.0041	0.0000
615.44	0.44	0.00	0.9959	0.0041	0.0000
615.43	0.43	0.00	0.9960	0.0040	0.0000
615.42	0.43	0.00	0.9961	0.0039	0.0000
615.41	0.43	0.00	0.9961	0.0039	0.0000

615.40	0.43	0.00	0.9962	0.0038	0.0000
615.39	0.43	0.00	0.9962	0.0038	0.0000
615.38	0.42	0.00	0.9963	0.0037	0.0000
615.37	0.42	0.00	0.9963	0.0037	0.0000
615.36	0.42	0.00	0.9964	0.0036	0.0000
615.35	0.42	0.00	0.9964	0.0036	0.0000
615.34	0.42	0.00	0.9965	0.0035	0.0000
615.33	0.41	0.00	0.9966	0.0034	0.0000
615.32	0.41	0.00	0.9966	0.0034	0.0000
615.31	0.41	0.00	0.9967	0.0033	0.0000
615.30	0.41	0.00	0.9967	0.0033	0.0000
615.29	0.41	0.00	0.9968	0.0032	0.0000
615.28	0.40	0.00	0.9968	0.0032	0.0000
615.27	0.40	0.00	0.9969	0.0031	0.0000
615.26	0.40	0.00	0.9969	0.0031	0.0000
615.25	0.40	0.00	0.9970	0.0030	0.0000
615.24	0.39	0.00	0.9970	0.0030	0.0000
615.23	0.39	0.00	0.9971	0.0029	0.0000
615.22	0.39	0.00	0.9971	0.0029	0.0000
615.21	0.39	0.00	0.9971	0.0029	0.0000
615.20	0.39	0.00	0.9972	0.0028	0.0000
615.19	0.38	0.00	0.9972	0.0028	0.0000
615.18	0.38	0.00	0.9973	0.0027	0.0000
615.17	0.38	0.00	0.9973	0.0027	0.0000
615.16	0.38	0.00	0.9974	0.0026	0.0000
615.15	0.38	0.00	0.9974	0.0026	0.0000
615.14	0.37	0.00	0.9975	0.0025	0.0000
615.13	0.37	0.00	0.9975	0.0025	0.0000
615.12	0.37	0.00	0.9975	0.0025	0.0000
615.11	0.37	0.00	0.9976	0.0024	0.0000
615.10	0.37	0.00	0.9976	0.0024	0.0000
615.09	0.36	0.00	0.9977	0.0023	0.0000
615.08	0.36	0.00	0.9977	0.0023	0.0000
615.07	0.36	0.00	0.9977	0.0023	0.0000
615.06	0.36	0.00	0.9978	0.0022	0.0000
615.05	0.35	0.00	0.9978	0.0022	0.0000
615.04	0.35	0.00	0.9979	0.0021	0.0000
615.03	0.35	0.00	0.9979	0.0021	0.0000
615.02	0.35	0.00	0.9979	0.0021	0.0000
615.01	0.35	0.00	0.9980	0.0020	0.0000
615.00	0.34	0.00	0.9980	0.0020	0.0000
614.99	0.34	0.00	0.9980	0.0020	0.0000
614.98	0.34	0.00	0.9981	0.0019	0.0000
614.97	0.34	0.00	0.9981	0.0019	0.0000
614.96	0.34	0.00	0.9982	0.0018	0.0000
614.95	0.33	0.00	0.9982	0.0018	0.0000
614.94	0.33	0.00	0.9982	0.0018	0.0000
614.93	0.33	0.00	0.9983	0.0017	0.0000
614.92	0.33	0.00	0.9983	0.0017	0.0000
614.91	0.33	0.00	0.9983	0.0017	0.0000
614.90	0.32	0.00	0.9984	0.0016	0.0000
614.89	0.32	0.00	0.9984	0.0016	0.0000
614.88	0.32	0.00	0.9984	0.0016	0.0000
614.87	0.32	0.00	0.9984	0.0016	0.0000
614.86	0.31	0.00	0.9985	0.0015	0.0000
614.85	0.31	0.00	0.9985	0.0015	0.0000
614.84	0.31	0.00	0.9985	0.0015	0.0000
614.83	0.31	0.00	0.9986	0.0014	0.0000
614.82	0.31	0.00	0.9986	0.0014	0.0000
614.81	0.30	0.00	0.9986	0.0014	0.0000
614.80	0.30	0.00	0.9987	0.0013	0.0000
614.79	0.30	0.00	0.9987	0.0013	0.0000
614.78	0.30	0.00	0.9987	0.0013	0.0000
614.77	0.30	0.00	0.9987	0.0013	0.0000
614.76	0.29	0.00	0.9988	0.0012	0.0000
614.75	0.29	0.00	0.9988	0.0012	0.0000
614.74	0.29	0.00	0.9988	0.0012	0.0000
614.73	0.29	0.00	0.9988	0.0012	0.0000
614.72	0.29	0.00	0.9989	0.0011	0.0000
614.71	0.28	0.00	0.9989	0.0011	0.0000
614.70	0.28	0.00	0.9989	0.0011	0.0000
614.69	0.28	0.00	0.9989	0.0011	0.0000
614.68	0.28	0.00	0.9990	0.0010	0.0000
614.67	0.28	0.00	0.9990	0.0010	0.0000
614.66	0.27	0.00	0.9990	0.0010	0.0000
614.65	0.27	0.00	0.9990	0.0010	0.0000
614.64	0.27	0.00	0.9991	0.0009	0.0000
614.63	0.27	0.00	0.9991	0.0009	0.0000
614.62	0.26	0.00	0.9991	0.0009	0.0000





	613.82	0.10	0.00	1.0000	0.0000	0.0000
	613.81	0.09	0.00	1.0000	0.0000	0.0000
	613.80	0.09	0.00	1.0000	0.0000	0.0000
	613.79	0.09	0.00	1.0000	0.0000	0.0000
	613.78	0.09	0.00	1.0000	0.0000	0.0000
	613.77	0.09	0.00	1.0000	0.0000	0.0000
	613.76	0.08	0.00	1.0000	0.0000	0.0000
	613.75	0.08	0.00	1.0000	0.0000	0.0000
	613.74	0.08	0.00	1.0000	0.0000	0.0000
	613.73	0.08	0.00	1.0000	0.0000	0.0000
	613.72	0.08	0.00	1.0000	0.0000	0.0000
	613.71	0.07	0.00	1.0000	0.0000	0.0000
	613.70	0.07	0.00	1.0000	0.0000	0.0000
	613.69	0.07	0.00	1.0000	0.0000	0.0000
	613.68	0.07	0.00	1.0000	0.0000	0.0000
	613.67	0.07	0.00	1.0000	0.0000	0.0000
	613.66	0.06	0.00	1.0000	0.0000	0.0000
	613.65	0.06	0.00	1.0000	0.0000	0.0000
	613.64	0.06	0.00	1.0000	0.0000	0.0000
	613.63	0.06	0.00	1.0000	0.0000	0.0000
	613.62	0.05	0.00	1.0000	0.0000	0.0000
	613.61	0.05	0.00	1.0000	0.0000	0.0000
	613.60	0.05	0.00	1.0000	0.0000	0.0000
	613.59	0.05	0.00	1.0000	0.0000	0.0000
	613.58	0.05	0.00	1.0000	0.0000	0.0000
	613.57	0.04	0.00	1.0000	0.0000	0.0000
	613.56	0.04	0.00	1.0000	0.0000	0.0000
	613.55	0.04	0.00	1.0000	0.0000	0.0000
	613.54	0.04	0.00	1.0000	0.0000	0.0000
	613.53	0.04	0.00	1.0000	0.0000	0.0000
	613.52	0.03	0.00	1.0000	0.0000	0.0000
	613.51	0.03	0.00	1.0000	0.0000	0.0000
	613.50	0.03	0.00	1.0000	0.0000	0.0000
	613.49	0.03	0.00	1.0000	0.0000	0.0000
	613.48	0.03	0.00	1.0000	0.0000	0.0000
	613.47	0.02	0.00	1.0000	0.0000	0.0000
	613.46	0.02	0.00	1.0000	0.0000	0.0000
	613.45	0.02	0.00	1.0000	0.0000	0.0000
	613.44	0.02	0.00	1.0000	0.0000	0.0000
	613.43	0.02	0.00	1.0000	0.0000	0.0000
	613.42	0.01	0.00	1.0000	0.0000	0.0000
	613.41	0.01	0.00	1.0000	0.0000	0.0000
	613.40	0.01	0.00	1.0000	0.0000	0.0000
	613.39	0.01	0.00	1.0000	0.0000	0.0000
	613.38	0.00	0.00	1.0000	0.0000	0.0000
	613.37	0.00	0.00	1.0000	0.0000	0.0000
	613.36	0.00	0.00	1.0000	0.0000	0.0000
Zow =	613.36	0.00	0.00	1.0000	0.0000	0.0000

Oil Specific Volume 0.0212 ft<sup>3</sup>/ft<sup>2</sup>

Data Entry Worksheet for Soil Samples -- Oil Specific Volume (OSV) Calculations

Project No. = 406   = User must enter the soil or fluid parameter, or lab data, as appropriate  
 Boring Designation = LRMW-1

Soil Parameters

Fluid Parameters

Oil Parameters

Required to Estimate OSV - Soil

Required to Estimate OSV - Soil

$\rho_b = 1.59 \text{ g/cm}^3$  Bulk density of soil

$\rho_o = 0.7702 \text{ g/cm}^3$  Oil density

Soil Sample Data

Sample Intervals (maximum 21 samples)

	Feet (bgs)	to	Feet (bgs)	GRO or DRO (mg/kg)
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				

Deepest sample must be entered in this row

Data Entry Worksheet for Monitoring Well Fluid Data -- Oil Specific Volume (OSV) Calculations

Project No. = 406  
Boring Designation = LRMW-1

[ ] = User must enter the soil or fluid parameter, or lab data, as appropriate

Soil Parameters

Required to Estimate OSV - MWs

$\phi$  = 0.403 Total porosity  
 $\sigma_{ow}$  = 17.89 dynes/cm Oil/Water Interfacial Tension  
 $\sigma_{ao}$  = 21.82 dynes/cm Air/Oil Surface Tension  
 $\sigma_{aw}$  = 62.44 dynes/cm Air/Water Surface Tension  
 $\alpha$  = 0.312 /foot Van Genuchten mean pore-size parameter  
 $n$  = 2.10000 Van Genuchten pore-size distribution exponent  
 $S_m$  = 0.046 Irreducible water saturation

Fluid Parameters

$\rho_{ro}$  = 0.7702 Ratio of oil to water density  
 $\beta_{ao}$  = 2.86 Ratio of water surface tension to oil surface tension  
 $\beta_{ow}$  = 3.49 Ratio of water surface tension to oil-water interfacial tension  
 $Z_{ow}$  = 17.19 feet Depth to oil/air interface  
 $Z_{ao}$  = 18.22 feet Depth to oil/water interface  
 $S_m$  = 0.046 Water saturation at field capacity  
 $\alpha$  = 0.312 /foot Van Genuchten mean pore-size parameter  
 $n$  = 2.10000 Van Genuchten pore-size distribution exponent  
 $m$  = 0.047619 Calculated from "n" (Burdine)  
 $dZ$  = 0.01 feet Integration increment (0.01 to 1.0)  
TOC = 629.03 feet Elevation of TOC or measuring point

Oil Specific Volume Calculation Spreadsheet for Soil Samples

Project No. 406  
Boring Designation LRMW-1

Depth (feet)	dZ (feet)	GRO or DRO (mg/kg)	$\theta_o$ (-)	$V_o$ (ft <sup>3</sup> /ft <sup>2</sup> )
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000

Oil Specific Volume = 0.000

**DO NOT CHANGE ANY CELLS ON THIS WORKSHEET**

Oil Specific Volume Calculation Spreadsheet for Free-phase Hydrocarbon in Monitoring Wells

Project No. 406  
Boring Designation LRMW-1

**DO NOT CHANGE ANY CELLS ON THIS WORKSHEET**

Z (feet)	h <sub>ow</sub> (feet)	h <sub>ao</sub> (feet)	S <sub>w</sub> (--)	S <sub>of</sub> (--)	φ S <sub>of</sub> dZ (ft <sup>3</sup> /ft <sup>2</sup> )
Z <sub>u</sub> = 612.43	0.37	0.45	0.9327	0.0000	0.0000
612.42	0.37	0.45	0.9334	0.0014	0.0000
612.41	0.37	0.44	0.9342	0.0027	0.0000
612.40	0.37	0.43	0.9350	0.0040	0.0000
612.39	0.36	0.42	0.9358	0.0053	0.0000
612.38	0.36	0.42	0.9365	0.0066	0.0000
612.37	0.36	0.41	0.9373	0.0078	0.0000
612.36	0.36	0.40	0.9381	0.0090	0.0000
612.35	0.35	0.39	0.9388	0.0102	0.0000
612.34	0.35	0.38	0.9396	0.0114	0.0000
612.33	0.35	0.38	0.9403	0.0126	0.0001
612.32	0.35	0.37	0.9411	0.0137	0.0001
612.31	0.34	0.36	0.9418	0.0148	0.0001
612.30	0.34	0.35	0.9426	0.0158	0.0001
612.29	0.34	0.35	0.9433	0.0168	0.0001
612.28	0.34	0.34	0.9440	0.0178	0.0001
612.27	0.34	0.33	0.9448	0.0188	0.0001
612.26	0.33	0.32	0.9455	0.0197	0.0001
612.25	0.33	0.32	0.9462	0.0207	0.0001
612.24	0.33	0.31	0.9469	0.0215	0.0001
612.23	0.33	0.30	0.9477	0.0224	0.0001
612.22	0.32	0.29	0.9484	0.0232	0.0001
612.21	0.32	0.28	0.9491	0.0240	0.0001
612.20	0.32	0.28	0.9498	0.0247	0.0001
612.19	0.32	0.27	0.9505	0.0254	0.0001
612.18	0.31	0.26	0.9512	0.0261	0.0001
612.17	0.31	0.25	0.9519	0.0268	0.0001
612.16	0.31	0.25	0.9526	0.0274	0.0001
612.15	0.31	0.24	0.9532	0.0279	0.0001
612.14	0.31	0.23	0.9539	0.0285	0.0001
612.13	0.30	0.22	0.9546	0.0290	0.0001
612.12	0.30	0.22	0.9553	0.0295	0.0001
612.11	0.30	0.21	0.9559	0.0299	0.0001
612.10	0.30	0.20	0.9566	0.0303	0.0001
612.09	0.29	0.19	0.9573	0.0307	0.0001
612.08	0.29	0.18	0.9579	0.0310	0.0001
612.07	0.29	0.18	0.9586	0.0313	0.0001
612.06	0.29	0.17	0.9592	0.0315	0.0001
612.05	0.28	0.16	0.9599	0.0317	0.0001
612.04	0.28	0.15	0.9605	0.0319	0.0001
612.03	0.28	0.15	0.9611	0.0320	0.0001
612.02	0.28	0.14	0.9617	0.0321	0.0001
612.01	0.28	0.13	0.9624	0.0322	0.0001
612.00	0.27	0.12	0.9630	0.0322	0.0001
611.99	0.27	0.11	0.9636	0.0322	0.0001
611.98	0.27	0.11	0.9642	0.0322	0.0001
611.97	0.27	0.10	0.9648	0.0321	0.0001
611.96	0.26	0.09	0.9654	0.0320	0.0001
611.95	0.26	0.08	0.9660	0.0318	0.0001
611.94	0.26	0.08	0.9666	0.0316	0.0001
611.93	0.26	0.07	0.9672	0.0314	0.0001
611.92	0.25	0.06	0.9678	0.0311	0.0001
611.91	0.25	0.05	0.9684	0.0308	0.0001
611.90	0.25	0.05	0.9689	0.0305	0.0001
611.89	0.25	0.04	0.9695	0.0301	0.0001
611.88	0.25	0.03	0.9701	0.0297	0.0001
611.87	0.24	0.02	0.9706	0.0292	0.0001
611.86	0.24	0.01	0.9712	0.0288	0.0001
611.85	0.24	0.01	0.9717	0.0283	0.0001
611.84	0.24	0.00	0.9723	0.0277	0.0001
611.83	0.23	0.00	0.9728	0.0272	0.0001
611.82	0.23	0.00	0.9733	0.0267	0.0001
611.81	0.23	0.00	0.9739	0.0261	0.0001
611.80	0.23	0.00	0.9744	0.0256	0.0001
611.79	0.23	0.00	0.9749	0.0251	0.0001
611.78	0.22	0.00	0.9754	0.0246	0.0001
611.77	0.22	0.00	0.9759	0.0241	0.0001

$$Z_u = \rho_{ro} \beta_{ao} H_o / [\rho_{ro} \beta_{ao} - (1 - \rho_{ro}) \beta_{ow}]$$

= 612.43 feet

where:

ρ<sub>ro</sub> = 0.7702

β<sub>ao</sub> = 2.86

β<sub>ow</sub> = 3.49

H<sub>o</sub> = 1.03 feet

Z<sub>ow</sub> = 610.81 feet

Z<sub>ao</sub> = 611.84 feet

Other parameters used in calculations (from Data Entry - MWs)

S<sub>m</sub> = 0.046

α = 0.312 /foot

n = 2.1

m = 0.047619048

dZ = 0.01 feet      Integration increment (0.01 to 1.0)

φ = 0.403

Oil Specific Volume

Σφ S<sub>of</sub> dZ = 9.4088E-03 ft<sup>3</sup>/ft<sup>2</sup>      Oil Specific Volume

611.76	0.22	0.00	0.9765	0.0235	0.0001
611.75	0.22	0.00	0.9770	0.0230	0.0001
611.74	0.21	0.00	0.9774	0.0226	0.0001
611.73	0.21	0.00	0.9779	0.0221	0.0001
611.72	0.21	0.00	0.9784	0.0216	0.0001
611.71	0.21	0.00	0.9789	0.0211	0.0001
611.70	0.20	0.00	0.9794	0.0206	0.0001
611.69	0.20	0.00	0.9798	0.0202	0.0001
611.68	0.20	0.00	0.9803	0.0197	0.0001
611.67	0.20	0.00	0.9808	0.0192	0.0001
611.66	0.20	0.00	0.9812	0.0188	0.0001
611.65	0.19	0.00	0.9817	0.0183	0.0001
611.64	0.19	0.00	0.9821	0.0179	0.0001
611.63	0.19	0.00	0.9826	0.0174	0.0001
611.62	0.19	0.00	0.9830	0.0170	0.0001
611.61	0.18	0.00	0.9834	0.0166	0.0001
611.60	0.18	0.00	0.9838	0.0162	0.0001
611.59	0.18	0.00	0.9843	0.0157	0.0001
611.58	0.18	0.00	0.9847	0.0153	0.0001
611.57	0.17	0.00	0.9851	0.0149	0.0001
611.56	0.17	0.00	0.9855	0.0145	0.0001
611.55	0.17	0.00	0.9859	0.0141	0.0001
611.54	0.17	0.00	0.9863	0.0137	0.0001
611.53	0.17	0.00	0.9866	0.0134	0.0001
611.52	0.16	0.00	0.9870	0.0130	0.0001
611.51	0.16	0.00	0.9874	0.0126	0.0001
611.50	0.16	0.00	0.9878	0.0122	0.0000
611.49	0.16	0.00	0.9881	0.0119	0.0000
611.48	0.15	0.00	0.9885	0.0115	0.0000
611.47	0.15	0.00	0.9888	0.0112	0.0000
611.46	0.15	0.00	0.9892	0.0108	0.0000
611.45	0.15	0.00	0.9895	0.0105	0.0000
611.44	0.14	0.00	0.9899	0.0101	0.0000
611.43	0.14	0.00	0.9902	0.0098	0.0000
611.42	0.14	0.00	0.9905	0.0095	0.0000
611.41	0.14	0.00	0.9908	0.0092	0.0000
611.40	0.14	0.00	0.9911	0.0089	0.0000
611.39	0.13	0.00	0.9915	0.0085	0.0000
611.38	0.13	0.00	0.9918	0.0082	0.0000
611.37	0.13	0.00	0.9921	0.0079	0.0000
611.36	0.13	0.00	0.9923	0.0077	0.0000
611.35	0.12	0.00	0.9926	0.0074	0.0000
611.34	0.12	0.00	0.9929	0.0071	0.0000
611.33	0.12	0.00	0.9932	0.0068	0.0000
611.32	0.12	0.00	0.9935	0.0065	0.0000
611.31	0.11	0.00	0.9937	0.0063	0.0000
611.30	0.11	0.00	0.9940	0.0060	0.0000
611.29	0.11	0.00	0.9942	0.0058	0.0000
611.28	0.11	0.00	0.9945	0.0055	0.0000
611.27	0.11	0.00	0.9947	0.0053	0.0000
611.26	0.10	0.00	0.9950	0.0050	0.0000
611.25	0.10	0.00	0.9952	0.0048	0.0000
611.24	0.10	0.00	0.9954	0.0046	0.0000
611.23	0.10	0.00	0.9956	0.0044	0.0000
611.22	0.09	0.00	0.9959	0.0041	0.0000
611.21	0.09	0.00	0.9961	0.0039	0.0000
611.20	0.09	0.00	0.9963	0.0037	0.0000
611.19	0.09	0.00	0.9965	0.0035	0.0000
611.18	0.08	0.00	0.9967	0.0033	0.0000
611.17	0.08	0.00	0.9968	0.0032	0.0000
611.16	0.08	0.00	0.9970	0.0030	0.0000
611.15	0.08	0.00	0.9972	0.0028	0.0000
611.14	0.08	0.00	0.9974	0.0026	0.0000
611.13	0.07	0.00	0.9975	0.0025	0.0000
611.12	0.07	0.00	0.9977	0.0023	0.0000
611.11	0.07	0.00	0.9978	0.0022	0.0000
611.10	0.07	0.00	0.9980	0.0020	0.0000
611.09	0.06	0.00	0.9981	0.0019	0.0000
611.08	0.06	0.00	0.9983	0.0017	0.0000
611.07	0.06	0.00	0.9984	0.0016	0.0000
611.06	0.06	0.00	0.9985	0.0015	0.0000
611.05	0.05	0.00	0.9987	0.0013	0.0000
611.04	0.05	0.00	0.9988	0.0012	0.0000
611.03	0.05	0.00	0.9989	0.0011	0.0000
611.02	0.05	0.00	0.9990	0.0010	0.0000
611.01	0.05	0.00	0.9991	0.0009	0.0000
611.00	0.04	0.00	0.9992	0.0008	0.0000
610.99	0.04	0.00	0.9993	0.0007	0.0000
610.98	0.04	0.00	0.9993	0.0007	0.0000









Data Entry Worksheet for Soil Samples -- Oil Specific Volume (OSV) Calculations

Project No. = 406   = User must enter the soil or fluid parameter, or lab data, as appropriate  
 Boring Designation = LRMW-2

Soil Parameters

Fluid Parameters

Oil Parameters

Required to Estimate OSV - Soil

Required to Estimate OSV - Soil

$\rho_b = 1.59 \text{ g/cm}^3$  Bulk density of soil

$\rho_o = 0.7702 \text{ g/cm}^3$  Oil density

Soil Sample Data

Sample Intervals (maximum 21 samples)

	Feet (bgs)	to	Feet (bgs)	GRO or DRO (mg/kg)
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				

Deepest sample must be entered in this row

Data Entry Worksheet for Monitoring Well Fluid Data -- Oil Specific Volume (OSV) Calculations

Project No. = 406  
Boring Designation = LRMW-2

[ ] = User must enter the soil or fluid parameter, or lab data, as appropriate

Soil Parameters

Required to Estimate OSV - MWs

$\phi$  = 0.403 Total porosity  
 $\sigma_{ow}$  = 17.89 dynes/cm Oil/Water Interfacial Tension  
 $\sigma_{ao}$  = 21.82 dynes/cm Air/Oil Surface Tension  
 $\sigma_{aw}$  = 62.44 dynes/cm Air/Water Surface Tension  
 $\alpha$  = 0.312 /foot Van Genuchten mean pore-size parameter  
 $n$  = 2.10000 Van Genuchten pore-size distribution exponent  
 $S_m$  = 0.046 Irreducible water saturation

Fluid Parameters

$\rho_{ro}$  = 0.7702 Ratio of oil to water density  
 $\beta_{ao}$  = 2.86 Ratio of water surface tension to oil surface tension  
 $\beta_{ow}$  = 3.49 Ratio of water surface tension to oil-water interfacial tension  
 $Z_{ow}$  = 17.75 feet Depth to oil/air interface  
 $Z_{ao}$  = 19.44 feet Depth to oil/water interface  
 $S_m$  = 0.046 Water saturation at field capacity  
 $\alpha$  = 0.312 /foot Van Genuchten mean pore-size parameter  
 $n$  = 2.10000 Van Genuchten pore-size distribution exponent  
 $m$  = 0.047619 Calculated from "n" (Burdine)  
 $dZ$  = 0.01 feet Integration increment (0.01 to 1.0)  
TOC = 629.28 feet Elevation of TOC or measuring point

Oil Specific Volume Calculation Spreadsheet for Soil Samples

Project No. 406  
Boring Designation LRMW-2

Depth (feet)	dZ (feet)	GRO or DRO (mg/kg)	$\theta_o$ (-)	$V_o$ (ft <sup>3</sup> /ft <sup>2</sup> )
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000

Oil Specific Volume = 0.000

**DO NOT CHANGE ANY CELLS ON THIS WORKSHEET**

Oil Specific Volume Calculation Spreadsheet for Free-phase Hydrocarbon in Monitoring Wells

Project No. 406  
Boring Designation LRMW-2

**DO NOT CHANGE ANY CELLS ON THIS WORKSHEET**

Z (feet)	h <sub>ow</sub> (feet)	h <sub>ao</sub> (feet)	S <sub>w</sub> (--)	S <sub>of</sub> (--)	φ S <sub>of</sub> dZ (ft <sup>3</sup> /ft <sup>2</sup> )
Z <sub>u</sub> = 612.50	0.61	0.74	0.8387	0.0000	0.0000
612.49	0.61	0.74	0.8396	0.0017	0.0000
612.48	0.61	0.73	0.8406	0.0034	0.0000
612.47	0.60	0.72	0.8416	0.0051	0.0000
612.46	0.60	0.71	0.8426	0.0068	0.0000
612.45	0.60	0.71	0.8435	0.0085	0.0000
612.44	0.60	0.70	0.8445	0.0102	0.0000
612.43	0.59	0.69	0.8455	0.0119	0.0000
612.42	0.59	0.68	0.8465	0.0135	0.0001
612.41	0.59	0.68	0.8474	0.0152	0.0001
612.40	0.59	0.67	0.8484	0.0168	0.0001
612.39	0.59	0.66	0.8494	0.0185	0.0001
612.38	0.58	0.65	0.8503	0.0201	0.0001
612.37	0.58	0.64	0.8513	0.0218	0.0001
612.36	0.58	0.64	0.8523	0.0234	0.0001
612.35	0.58	0.63	0.8532	0.0250	0.0001
612.34	0.57	0.62	0.8542	0.0266	0.0001
612.33	0.57	0.61	0.8552	0.0282	0.0001
612.32	0.57	0.61	0.8561	0.0297	0.0001
612.31	0.57	0.60	0.8571	0.0313	0.0001
612.30	0.56	0.59	0.8581	0.0329	0.0001
612.29	0.56	0.58	0.8590	0.0344	0.0001
612.28	0.56	0.58	0.8600	0.0359	0.0001
612.27	0.56	0.57	0.8610	0.0374	0.0002
612.26	0.56	0.56	0.8619	0.0389	0.0002
612.25	0.55	0.55	0.8629	0.0404	0.0002
612.24	0.55	0.54	0.8638	0.0419	0.0002
612.23	0.55	0.54	0.8648	0.0433	0.0002
612.22	0.55	0.53	0.8657	0.0447	0.0002
612.21	0.54	0.52	0.8667	0.0462	0.0002
612.20	0.54	0.51	0.8676	0.0476	0.0002
612.19	0.54	0.51	0.8686	0.0489	0.0002
612.18	0.54	0.50	0.8695	0.0503	0.0002
612.17	0.53	0.49	0.8705	0.0516	0.0002
612.16	0.53	0.48	0.8714	0.0529	0.0002
612.15	0.53	0.48	0.8724	0.0542	0.0002
612.14	0.53	0.47	0.8733	0.0555	0.0002
612.13	0.53	0.46	0.8743	0.0567	0.0002
612.12	0.52	0.45	0.8752	0.0580	0.0002
612.11	0.52	0.44	0.8762	0.0592	0.0002
612.10	0.52	0.44	0.8771	0.0603	0.0002
612.09	0.52	0.43	0.8780	0.0615	0.0002
612.08	0.51	0.42	0.8790	0.0626	0.0003
612.07	0.51	0.41	0.8799	0.0637	0.0003
612.06	0.51	0.41	0.8808	0.0648	0.0003
612.05	0.51	0.40	0.8818	0.0658	0.0003
612.04	0.50	0.39	0.8827	0.0669	0.0003
612.03	0.50	0.38	0.8836	0.0678	0.0003
612.02	0.50	0.37	0.8845	0.0688	0.0003
612.01	0.50	0.37	0.8855	0.0697	0.0003
612.00	0.50	0.36	0.8864	0.0706	0.0003
611.99	0.49	0.35	0.8873	0.0715	0.0003
611.98	0.49	0.34	0.8882	0.0723	0.0003
611.97	0.49	0.34	0.8891	0.0732	0.0003
611.96	0.49	0.33	0.8901	0.0739	0.0003
611.95	0.48	0.32	0.8910	0.0747	0.0003
611.94	0.48	0.31	0.8919	0.0754	0.0003
611.93	0.48	0.31	0.8928	0.0761	0.0003
611.92	0.48	0.30	0.8937	0.0767	0.0003
611.91	0.47	0.29	0.8946	0.0773	0.0003
611.90	0.47	0.28	0.8955	0.0779	0.0003
611.89	0.47	0.27	0.8964	0.0784	0.0003
611.88	0.47	0.27	0.8973	0.0789	0.0003
611.87	0.47	0.26	0.8982	0.0794	0.0003
611.86	0.46	0.25	0.8991	0.0798	0.0003
611.85	0.46	0.24	0.9000	0.0802	0.0003
611.84	0.46	0.24	0.9009	0.0806	0.0003

$$Z_u = \rho_{ro} \beta_{ao} H_o / [\rho_{ro} \beta_{ao} - (1 - \rho_{ro}) \beta_{ow}]$$

= 612.50 feet

where:

ρ<sub>ro</sub> = 0.7702

β<sub>ao</sub> = 2.86

β<sub>ow</sub> = 3.49

H<sub>o</sub> = 1.69 feet

Z<sub>ow</sub> = 609.84 feet

Z<sub>ao</sub> = 611.53 feet

Other parameters used in calculations (from Data Entry - MWs)

S<sub>m</sub> = 0.046

α = 0.312 /foot

n = 2.1

m = 0.047619048

dZ = 0.01 feet Integration increment (0.01 to 1.0)

φ = 0.403

Oil Specific Volume

Σφ S<sub>of</sub> dZ = 3.9385E-02 ft<sup>3</sup>/ft<sup>2</sup> Oil Specific Volume

611.83	0.46	0.23	0.9018	0.0809	0.0003
611.82	0.45	0.22	0.9027	0.0812	0.0003
611.81	0.45	0.21	0.9035	0.0815	0.0003
611.80	0.45	0.21	0.9044	0.0817	0.0003
611.79	0.45	0.20	0.9053	0.0818	0.0003
611.78	0.45	0.19	0.9062	0.0820	0.0003
611.77	0.44	0.18	0.9071	0.0821	0.0003
611.76	0.44	0.17	0.9079	0.0821	0.0003
611.75	0.44	0.17	0.9088	0.0821	0.0003
611.74	0.44	0.16	0.9097	0.0821	0.0003
611.73	0.43	0.15	0.9105	0.0821	0.0003
611.72	0.43	0.14	0.9114	0.0820	0.0003
611.71	0.43	0.14	0.9123	0.0818	0.0003
611.70	0.43	0.13	0.9131	0.0816	0.0003
611.69	0.42	0.12	0.9140	0.0814	0.0003
611.68	0.42	0.11	0.9148	0.0812	0.0003
611.67	0.42	0.11	0.9157	0.0809	0.0003
611.66	0.42	0.10	0.9165	0.0805	0.0003
611.65	0.42	0.09	0.9174	0.0801	0.0003
611.64	0.41	0.08	0.9182	0.0797	0.0003
611.63	0.41	0.07	0.9190	0.0793	0.0003
611.62	0.41	0.07	0.9199	0.0788	0.0003
611.61	0.41	0.06	0.9207	0.0783	0.0003
611.60	0.40	0.05	0.9215	0.0777	0.0003
611.59	0.40	0.04	0.9224	0.0771	0.0003
611.58	0.40	0.04	0.9232	0.0764	0.0003
611.57	0.40	0.03	0.9240	0.0758	0.0003
611.56	0.39	0.02	0.9248	0.0751	0.0003
611.55	0.39	0.01	0.9256	0.0743	0.0003
611.54	0.39	0.01	0.9265	0.0735	0.0003
611.53	0.39	0.00	0.9273	0.0727	0.0003
611.52	0.39	0.00	0.9281	0.0719	0.0003
611.51	0.38	0.00	0.9289	0.0711	0.0003
611.50	0.38	0.00	0.9297	0.0703	0.0003
611.49	0.38	0.00	0.9305	0.0695	0.0003
611.48	0.38	0.00	0.9313	0.0687	0.0003
611.47	0.37	0.00	0.9321	0.0679	0.0003
611.46	0.37	0.00	0.9328	0.0672	0.0003
611.45	0.37	0.00	0.9336	0.0664	0.0003
611.44	0.37	0.00	0.9344	0.0656	0.0003
611.43	0.36	0.00	0.9352	0.0648	0.0003
611.42	0.36	0.00	0.9360	0.0640	0.0003
611.41	0.36	0.00	0.9367	0.0633	0.0003
611.40	0.36	0.00	0.9375	0.0625	0.0003
611.39	0.36	0.00	0.9383	0.0617	0.0002
611.38	0.35	0.00	0.9390	0.0610	0.0002
611.37	0.35	0.00	0.9398	0.0602	0.0002
611.36	0.35	0.00	0.9405	0.0595	0.0002
611.35	0.35	0.00	0.9413	0.0587	0.0002
611.34	0.34	0.00	0.9420	0.0580	0.0002
611.33	0.34	0.00	0.9428	0.0572	0.0002
611.32	0.34	0.00	0.9435	0.0565	0.0002
611.31	0.34	0.00	0.9442	0.0558	0.0002
611.30	0.33	0.00	0.9450	0.0550	0.0002
611.29	0.33	0.00	0.9457	0.0543	0.0002
611.28	0.33	0.00	0.9464	0.0536	0.0002
611.27	0.33	0.00	0.9471	0.0529	0.0002
611.26	0.33	0.00	0.9478	0.0522	0.0002
611.25	0.32	0.00	0.9485	0.0515	0.0002
611.24	0.32	0.00	0.9493	0.0507	0.0002
611.23	0.32	0.00	0.9500	0.0500	0.0002
611.22	0.32	0.00	0.9507	0.0493	0.0002
611.21	0.31	0.00	0.9513	0.0487	0.0002
611.20	0.31	0.00	0.9520	0.0480	0.0002
611.19	0.31	0.00	0.9527	0.0473	0.0002
611.18	0.31	0.00	0.9534	0.0466	0.0002
611.17	0.30	0.00	0.9541	0.0459	0.0002
611.16	0.30	0.00	0.9548	0.0452	0.0002
611.15	0.30	0.00	0.9554	0.0446	0.0002
611.14	0.30	0.00	0.9561	0.0439	0.0002
611.13	0.30	0.00	0.9568	0.0432	0.0002
611.12	0.29	0.00	0.9574	0.0426	0.0002
611.11	0.29	0.00	0.9581	0.0419	0.0002
611.10	0.29	0.00	0.9587	0.0413	0.0002
611.09	0.29	0.00	0.9594	0.0406	0.0002
611.08	0.28	0.00	0.9600	0.0400	0.0002
611.07	0.28	0.00	0.9606	0.0394	0.0002
611.06	0.28	0.00	0.9613	0.0387	0.0002
611.05	0.28	0.00	0.9619	0.0381	0.0002

611.04	0.28	0.00	0.9625	0.0375	0.0002
611.03	0.27	0.00	0.9631	0.0369	0.0001
611.02	0.27	0.00	0.9638	0.0362	0.0001
611.01	0.27	0.00	0.9644	0.0356	0.0001
611.00	0.27	0.00	0.9650	0.0350	0.0001
610.99	0.26	0.00	0.9656	0.0344	0.0001
610.98	0.26	0.00	0.9662	0.0338	0.0001
610.97	0.26	0.00	0.9668	0.0332	0.0001
610.96	0.26	0.00	0.9673	0.0327	0.0001
610.95	0.25	0.00	0.9679	0.0321	0.0001
610.94	0.25	0.00	0.9685	0.0315	0.0001
610.93	0.25	0.00	0.9691	0.0309	0.0001
610.92	0.25	0.00	0.9696	0.0304	0.0001
610.91	0.25	0.00	0.9702	0.0298	0.0001
610.90	0.24	0.00	0.9708	0.0292	0.0001
610.89	0.24	0.00	0.9713	0.0287	0.0001
610.88	0.24	0.00	0.9719	0.0281	0.0001
610.87	0.24	0.00	0.9724	0.0276	0.0001
610.86	0.23	0.00	0.9729	0.0271	0.0001
610.85	0.23	0.00	0.9735	0.0265	0.0001
610.84	0.23	0.00	0.9740	0.0260	0.0001
610.83	0.23	0.00	0.9745	0.0255	0.0001
610.82	0.22	0.00	0.9750	0.0250	0.0001
610.81	0.22	0.00	0.9756	0.0244	0.0001
610.80	0.22	0.00	0.9761	0.0239	0.0001
610.79	0.22	0.00	0.9766	0.0234	0.0001
610.78	0.22	0.00	0.9771	0.0229	0.0001
610.77	0.21	0.00	0.9776	0.0224	0.0001
610.76	0.21	0.00	0.9781	0.0219	0.0001
610.75	0.21	0.00	0.9785	0.0215	0.0001
610.74	0.21	0.00	0.9790	0.0210	0.0001
610.73	0.20	0.00	0.9795	0.0205	0.0001
610.72	0.20	0.00	0.9800	0.0200	0.0001
610.71	0.20	0.00	0.9804	0.0196	0.0001
610.70	0.20	0.00	0.9809	0.0191	0.0001
610.69	0.19	0.00	0.9813	0.0187	0.0001
610.68	0.19	0.00	0.9818	0.0182	0.0001
610.67	0.19	0.00	0.9822	0.0178	0.0001
610.66	0.19	0.00	0.9827	0.0173	0.0001
610.65	0.19	0.00	0.9831	0.0169	0.0001
610.64	0.18	0.00	0.9835	0.0165	0.0001
610.63	0.18	0.00	0.9839	0.0161	0.0001
610.62	0.18	0.00	0.9844	0.0156	0.0001
610.61	0.18	0.00	0.9848	0.0152	0.0001
610.60	0.17	0.00	0.9852	0.0148	0.0001
610.59	0.17	0.00	0.9856	0.0144	0.0001
610.58	0.17	0.00	0.9860	0.0140	0.0001
610.57	0.17	0.00	0.9863	0.0137	0.0001
610.56	0.16	0.00	0.9867	0.0133	0.0001
610.55	0.16	0.00	0.9871	0.0129	0.0001
610.54	0.16	0.00	0.9875	0.0125	0.0001
610.53	0.16	0.00	0.9879	0.0121	0.0000
610.52	0.16	0.00	0.9882	0.0118	0.0000
610.51	0.15	0.00	0.9886	0.0114	0.0000
610.50	0.15	0.00	0.9889	0.0111	0.0000
610.49	0.15	0.00	0.9893	0.0107	0.0000
610.48	0.15	0.00	0.9896	0.0104	0.0000
610.47	0.14	0.00	0.9899	0.0101	0.0000
610.46	0.14	0.00	0.9903	0.0097	0.0000
610.45	0.14	0.00	0.9906	0.0094	0.0000
610.44	0.14	0.00	0.9909	0.0091	0.0000
610.43	0.13	0.00	0.9912	0.0088	0.0000
610.42	0.13	0.00	0.9915	0.0085	0.0000
610.41	0.13	0.00	0.9918	0.0082	0.0000
610.40	0.13	0.00	0.9921	0.0079	0.0000
610.39	0.13	0.00	0.9924	0.0076	0.0000
610.38	0.12	0.00	0.9927	0.0073	0.0000
610.37	0.12	0.00	0.9930	0.0070	0.0000
610.36	0.12	0.00	0.9933	0.0067	0.0000
610.35	0.12	0.00	0.9935	0.0065	0.0000
610.34	0.11	0.00	0.9938	0.0062	0.0000
610.33	0.11	0.00	0.9940	0.0060	0.0000
610.32	0.11	0.00	0.9943	0.0057	0.0000
610.31	0.11	0.00	0.9945	0.0055	0.0000
610.30	0.10	0.00	0.9948	0.0052	0.0000
610.29	0.10	0.00	0.9950	0.0050	0.0000
610.28	0.10	0.00	0.9952	0.0048	0.0000
610.27	0.10	0.00	0.9955	0.0045	0.0000
610.26	0.10	0.00	0.9957	0.0043	0.0000







Data Entry Worksheet for Soil Samples -- Oil Specific Volume (OSV) Calculations

Project No. = 406   = User must enter the soil or fluid parameter, or lab data, as appropriate  
 Boring Designation = LRMW-3

Soil Parameters

Fluid Parameters

Oil Parameters

Required to Estimate OSV - Soil

Required to Estimate OSV - Soil

$\rho_b = 1.59 \text{ g/cm}^3$  Bulk density of soil

$\rho_o = 0.7702 \text{ g/cm}^3$  Oil density

Soil Sample Data

Sample Intervals (maximum 21 samples)

	Feet (bgs)	to	Feet (bgs)	GRO or DRO (mg/kg)
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				

Deepest sample must be entered in this row

## Data Entry Worksheet for Monitoring Well Fluid Data -- Oil Specific Volume (OSV) Calculations

Project No. = 406  
Boring Designation = LRMW-3

= User must enter the soil or fluid parameter, or lab data, as appropriate

### Soil Parameters

#### Required to Estimate OSV - MWs

$\phi$  = 0.403 Total porosity  
 $\sigma_{ow}$  = 17.89 dynes/cm Oil/Water Interfacial Tension  
 $\sigma_{ao}$  = 21.82 dynes/cm Air/Oil Surface Tension  
 $\sigma_{aw}$  = 62.44 dynes/cm Air/Water Surface Tension  
 $\alpha$  = 0.312 /foot Van Genuchten mean pore-size parameter  
 $n$  = 2.10000 Van Genuchten pore-size distribution exponent  
 $S_m$  = 0.046 Irreducible water saturation

### Fluid Parameters

$\rho_{ro}$  = 0.7702 Ratio of oil to water density  
 $\beta_{ao}$  = 2.86 Ratio of water surface tension to oil surface tension  
 $\beta_{ow}$  = 3.49 Ratio of water surface tension to oil-water interfacial tension  
 $Z_{ow}$  = 17.91 feet Depth to oil/air interface  
 $Z_{ao}$  = 20.42 feet Depth to oil/water interface  
 $S_m$  = 0.046 Water saturation at field capacity  
 $\alpha$  = 0.312 /foot Van Genuchten mean pore-size parameter  
 $n$  = 2.10000 Van Genuchten pore-size distribution exponent  
 $m$  = 0.047619 Calculated from "n" (Burdine)  
 $dZ$  = 0.01 feet Integration increment (0.01 to 1.0)  
TOC = 630.45 feet Elevation of TOC or measuring point



Oil Specific Volume Calculation Spreadsheet for Free-phase Hydrocarbon in Monitoring Wells

Project No. 406  
 Boring Designation LRMW-3

**DO NOT CHANGE ANY CELLS ON THIS WORKSHEET**

Z (feet)	h <sub>ow</sub> (feet)	h <sub>ao</sub> (feet)	S <sub>w</sub> (--)	S <sub>of</sub> (--)	φ S <sub>of</sub> dZ (ft <sup>3</sup> /ft <sup>2</sup> )
Z <sub>u</sub> = 613.98	0.91	1.11	0.7141	0.0000	0.0000
613.97	0.90	1.10	0.7151	0.0016	0.0000
613.96	0.90	1.09	0.7160	0.0032	0.0000
613.95	0.90	1.08	0.7169	0.0049	0.0000
613.94	0.90	1.08	0.7178	0.0065	0.0000
613.93	0.90	1.07	0.7187	0.0081	0.0000
613.92	0.89	1.06	0.7197	0.0098	0.0000
613.91	0.89	1.05	0.7206	0.0114	0.0000
613.90	0.89	1.04	0.7215	0.0131	0.0001
613.89	0.89	1.04	0.7225	0.0147	0.0001
613.88	0.88	1.03	0.7234	0.0164	0.0001
613.87	0.88	1.02	0.7243	0.0181	0.0001
613.86	0.88	1.01	0.7252	0.0198	0.0001
613.85	0.88	1.01	0.7262	0.0215	0.0001
613.84	0.87	1.00	0.7271	0.0231	0.0001
613.83	0.87	0.99	0.7280	0.0248	0.0001
613.82	0.87	0.98	0.7290	0.0265	0.0001
613.81	0.87	0.98	0.7299	0.0283	0.0001
613.80	0.87	0.97	0.7309	0.0300	0.0001
613.79	0.86	0.96	0.7318	0.0317	0.0001
613.78	0.86	0.95	0.7327	0.0334	0.0001
613.77	0.86	0.94	0.7337	0.0351	0.0001
613.76	0.86	0.94	0.7346	0.0369	0.0001
613.75	0.85	0.93	0.7356	0.0386	0.0002
613.74	0.85	0.92	0.7365	0.0403	0.0002
613.73	0.85	0.91	0.7374	0.0421	0.0002
613.72	0.85	0.91	0.7384	0.0438	0.0002
613.71	0.84	0.90	0.7393	0.0455	0.0002
613.70	0.84	0.89	0.7403	0.0473	0.0002
613.69	0.84	0.88	0.7412	0.0490	0.0002
613.68	0.84	0.87	0.7422	0.0508	0.0002
613.67	0.84	0.87	0.7431	0.0525	0.0002
613.66	0.83	0.86	0.7441	0.0543	0.0002
613.65	0.83	0.85	0.7450	0.0560	0.0002
613.64	0.83	0.84	0.7460	0.0578	0.0002
613.63	0.83	0.84	0.7469	0.0595	0.0002
613.62	0.82	0.83	0.7479	0.0613	0.0002
613.61	0.82	0.82	0.7488	0.0630	0.0003
613.60	0.82	0.81	0.7498	0.0648	0.0003
613.59	0.82	0.81	0.7508	0.0665	0.0003
613.58	0.81	0.80	0.7517	0.0683	0.0003
613.57	0.81	0.79	0.7527	0.0700	0.0003
613.56	0.81	0.78	0.7536	0.0718	0.0003
613.55	0.81	0.77	0.7546	0.0735	0.0003
613.54	0.81	0.77	0.7556	0.0753	0.0003
613.53	0.80	0.76	0.7565	0.0770	0.0003
613.52	0.80	0.75	0.7575	0.0787	0.0003
613.51	0.80	0.74	0.7584	0.0805	0.0003
613.50	0.80	0.74	0.7594	0.0822	0.0003
613.49	0.79	0.73	0.7604	0.0839	0.0003
613.48	0.79	0.72	0.7613	0.0856	0.0003
613.47	0.79	0.71	0.7623	0.0873	0.0004
613.46	0.79	0.71	0.7633	0.0890	0.0004
613.45	0.78	0.70	0.7642	0.0907	0.0004
613.44	0.78	0.69	0.7652	0.0924	0.0004
613.43	0.78	0.68	0.7662	0.0940	0.0004
613.42	0.78	0.67	0.7671	0.0957	0.0004
613.41	0.78	0.67	0.7681	0.0974	0.0004
613.40	0.77	0.66	0.7691	0.0990	0.0004
613.39	0.77	0.65	0.7700	0.1006	0.0004
613.38	0.77	0.64	0.7710	0.1023	0.0004
613.37	0.77	0.64	0.7720	0.1039	0.0004
613.36	0.76	0.63	0.7730	0.1055	0.0004
613.35	0.76	0.62	0.7739	0.1071	0.0004
613.34	0.76	0.61	0.7749	0.1087	0.0004
613.33	0.76	0.61	0.7759	0.1102	0.0004
613.32	0.76	0.60	0.7769	0.1118	0.0005

$$Z_u = \rho_{ro} \beta_{ao} H_o / [\rho_{ro} \beta_{ao} - (1 - \rho_{ro}) \beta_{ow}]$$

= 613.98 feet

where:

ρ<sub>ro</sub> = 0.7702

β<sub>ao</sub> = 2.86

β<sub>ow</sub> = 3.49

H<sub>o</sub> = 2.51 feet

Z<sub>ow</sub> = 610.03 feet

Z<sub>ao</sub> = 612.54 feet

Other parameters used in calculations (from Data Entry - MWs)

S<sub>m</sub> = 0.046

α = 0.312 /foot

n = 2.1

m = 0.047619048

dZ = 0.01 feet      Integration increment (0.01 to 1.0)

φ = 0.403

Oil Specific Volume

Σφ S<sub>of</sub> dZ = 1.1350E-01 ft<sup>3</sup>/ft<sup>2</sup>      Oil Specific Volume

613.31	0.75	0.59	0.7778	0.1133	0.0005
613.30	0.75	0.58	0.7788	0.1148	0.0005
613.29	0.75	0.57	0.7798	0.1163	0.0005
613.28	0.75	0.57	0.7808	0.1178	0.0005
613.27	0.74	0.56	0.7817	0.1193	0.0005
613.26	0.74	0.55	0.7827	0.1208	0.0005
613.25	0.74	0.54	0.7837	0.1222	0.0005
613.24	0.74	0.54	0.7847	0.1236	0.0005
613.23	0.73	0.53	0.7857	0.1250	0.0005
613.22	0.73	0.52	0.7866	0.1264	0.0005
613.21	0.73	0.51	0.7876	0.1278	0.0005
613.20	0.73	0.51	0.7886	0.1291	0.0005
613.19	0.73	0.50	0.7896	0.1304	0.0005
613.18	0.72	0.49	0.7906	0.1317	0.0005
613.17	0.72	0.48	0.7915	0.1330	0.0005
613.16	0.72	0.47	0.7925	0.1343	0.0005
613.15	0.72	0.47	0.7935	0.1355	0.0005
613.14	0.71	0.46	0.7945	0.1367	0.0006
613.13	0.71	0.45	0.7955	0.1379	0.0006
613.12	0.71	0.44	0.7965	0.1390	0.0006
613.11	0.71	0.44	0.7974	0.1402	0.0006
613.10	0.70	0.43	0.7984	0.1413	0.0006
613.09	0.70	0.42	0.7994	0.1423	0.0006
613.08	0.70	0.41	0.8004	0.1434	0.0006
613.07	0.70	0.41	0.8014	0.1444	0.0006
613.06	0.70	0.40	0.8024	0.1454	0.0006
613.05	0.69	0.39	0.8033	0.1464	0.0006
613.04	0.69	0.38	0.8043	0.1473	0.0006
613.03	0.69	0.37	0.8053	0.1482	0.0006
613.02	0.69	0.37	0.8063	0.1491	0.0006
613.01	0.68	0.36	0.8073	0.1499	0.0006
613.00	0.68	0.35	0.8083	0.1507	0.0006
612.99	0.68	0.34	0.8093	0.1515	0.0006
612.98	0.68	0.34	0.8102	0.1522	0.0006
612.97	0.67	0.33	0.8112	0.1529	0.0006
612.96	0.67	0.32	0.8122	0.1536	0.0006
612.95	0.67	0.31	0.8132	0.1542	0.0006
612.94	0.67	0.30	0.8142	0.1548	0.0006
612.93	0.67	0.30	0.8152	0.1554	0.0006
612.92	0.66	0.29	0.8162	0.1559	0.0006
612.91	0.66	0.28	0.8171	0.1564	0.0006
612.90	0.66	0.27	0.8181	0.1569	0.0006
612.89	0.66	0.27	0.8191	0.1573	0.0006
612.88	0.65	0.26	0.8201	0.1577	0.0006
612.87	0.65	0.25	0.8211	0.1580	0.0006
612.86	0.65	0.24	0.8221	0.1583	0.0006
612.85	0.65	0.24	0.8230	0.1586	0.0006
612.84	0.64	0.23	0.8240	0.1588	0.0006
612.83	0.64	0.22	0.8250	0.1590	0.0006
612.82	0.64	0.21	0.8260	0.1591	0.0006
612.81	0.64	0.20	0.8270	0.1592	0.0006
612.80	0.64	0.20	0.8280	0.1593	0.0006
612.79	0.63	0.19	0.8289	0.1593	0.0006
612.78	0.63	0.18	0.8299	0.1593	0.0006
612.77	0.63	0.17	0.8309	0.1592	0.0006
612.76	0.63	0.17	0.8319	0.1591	0.0006
612.75	0.62	0.16	0.8329	0.1590	0.0006
612.74	0.62	0.15	0.8338	0.1588	0.0006
612.73	0.62	0.14	0.8348	0.1586	0.0006
612.72	0.62	0.14	0.8358	0.1583	0.0006
612.71	0.61	0.13	0.8368	0.1580	0.0006
612.70	0.61	0.12	0.8378	0.1577	0.0006
612.69	0.61	0.11	0.8387	0.1573	0.0006
612.68	0.61	0.10	0.8397	0.1569	0.0006
612.67	0.61	0.10	0.8407	0.1564	0.0006
612.66	0.60	0.09	0.8417	0.1559	0.0006
612.65	0.60	0.08	0.8426	0.1553	0.0006
612.64	0.60	0.07	0.8436	0.1547	0.0006
612.63	0.60	0.07	0.8446	0.1541	0.0006
612.62	0.59	0.06	0.8456	0.1534	0.0006
612.61	0.59	0.05	0.8465	0.1527	0.0006
612.60	0.59	0.04	0.8475	0.1520	0.0006
612.59	0.59	0.04	0.8485	0.1512	0.0006
612.58	0.59	0.03	0.8495	0.1503	0.0006
612.57	0.58	0.02	0.8504	0.1495	0.0006
612.56	0.58	0.01	0.8514	0.1486	0.0006
612.55	0.58	0.00	0.8524	0.1476	0.0006
612.54	0.58	0.00	0.8533	0.1467	0.0006
612.53	0.57	0.00	0.8543	0.1457	0.0006

612.52	0.57	0.00	0.8553	0.1447	0.0006
612.51	0.57	0.00	0.8562	0.1438	0.0006
612.50	0.57	0.00	0.8572	0.1428	0.0006
612.49	0.56	0.00	0.8582	0.1418	0.0006
612.48	0.56	0.00	0.8591	0.1409	0.0006
612.47	0.56	0.00	0.8601	0.1399	0.0006
612.46	0.56	0.00	0.8610	0.1390	0.0006
612.45	0.56	0.00	0.8620	0.1380	0.0006
612.44	0.55	0.00	0.8630	0.1370	0.0006
612.43	0.55	0.00	0.8639	0.1361	0.0005
612.42	0.55	0.00	0.8649	0.1351	0.0005
612.41	0.55	0.00	0.8658	0.1342	0.0005
612.40	0.54	0.00	0.8668	0.1332	0.0005
612.39	0.54	0.00	0.8677	0.1323	0.0005
612.38	0.54	0.00	0.8687	0.1313	0.0005
612.37	0.54	0.00	0.8696	0.1304	0.0005
612.36	0.53	0.00	0.8706	0.1294	0.0005
612.35	0.53	0.00	0.8715	0.1285	0.0005
612.34	0.53	0.00	0.8725	0.1275	0.0005
612.33	0.53	0.00	0.8734	0.1266	0.0005
612.32	0.53	0.00	0.8744	0.1256	0.0005
612.31	0.52	0.00	0.8753	0.1247	0.0005
612.30	0.52	0.00	0.8762	0.1238	0.0005
612.29	0.52	0.00	0.8772	0.1228	0.0005
612.28	0.52	0.00	0.8781	0.1219	0.0005
612.27	0.51	0.00	0.8790	0.1210	0.0005
612.26	0.51	0.00	0.8800	0.1200	0.0005
612.25	0.51	0.00	0.8809	0.1191	0.0005
612.24	0.51	0.00	0.8818	0.1182	0.0005
612.23	0.50	0.00	0.8828	0.1172	0.0005
612.22	0.50	0.00	0.8837	0.1163	0.0005
612.21	0.50	0.00	0.8846	0.1154	0.0005
612.20	0.50	0.00	0.8855	0.1145	0.0005
612.19	0.50	0.00	0.8865	0.1135	0.0005
612.18	0.49	0.00	0.8874	0.1126	0.0005
612.17	0.49	0.00	0.8883	0.1117	0.0005
612.16	0.49	0.00	0.8892	0.1108	0.0004
612.15	0.49	0.00	0.8901	0.1099	0.0004
612.14	0.48	0.00	0.8911	0.1089	0.0004
612.13	0.48	0.00	0.8920	0.1080	0.0004
612.12	0.48	0.00	0.8929	0.1071	0.0004
612.11	0.48	0.00	0.8938	0.1062	0.0004
612.10	0.47	0.00	0.8947	0.1053	0.0004
612.09	0.47	0.00	0.8956	0.1044	0.0004
612.08	0.47	0.00	0.8965	0.1035	0.0004
612.07	0.47	0.00	0.8974	0.1026	0.0004
612.06	0.47	0.00	0.8983	0.1017	0.0004
612.05	0.46	0.00	0.8992	0.1008	0.0004
612.04	0.46	0.00	0.9001	0.0999	0.0004
612.03	0.46	0.00	0.9010	0.0990	0.0004
612.02	0.46	0.00	0.9019	0.0981	0.0004
612.01	0.45	0.00	0.9027	0.0973	0.0004
612.00	0.45	0.00	0.9036	0.0964	0.0004
611.99	0.45	0.00	0.9045	0.0955	0.0004
611.98	0.45	0.00	0.9054	0.0946	0.0004
611.97	0.44	0.00	0.9063	0.0937	0.0004
611.96	0.44	0.00	0.9071	0.0929	0.0004
611.95	0.44	0.00	0.9080	0.0920	0.0004
611.94	0.44	0.00	0.9089	0.0911	0.0004
611.93	0.44	0.00	0.9097	0.0903	0.0004
611.92	0.43	0.00	0.9106	0.0894	0.0004
611.91	0.43	0.00	0.9115	0.0885	0.0004
611.90	0.43	0.00	0.9123	0.0877	0.0004
611.89	0.43	0.00	0.9132	0.0868	0.0003
611.88	0.42	0.00	0.9140	0.0860	0.0003
611.87	0.42	0.00	0.9149	0.0851	0.0003
611.86	0.42	0.00	0.9157	0.0843	0.0003
611.85	0.42	0.00	0.9166	0.0834	0.0003
611.84	0.42	0.00	0.9174	0.0826	0.0003
611.83	0.41	0.00	0.9183	0.0817	0.0003
611.82	0.41	0.00	0.9191	0.0809	0.0003
611.81	0.41	0.00	0.9200	0.0800	0.0003
611.80	0.41	0.00	0.9208	0.0792	0.0003
611.79	0.40	0.00	0.9216	0.0784	0.0003
611.78	0.40	0.00	0.9224	0.0776	0.0003
611.77	0.40	0.00	0.9233	0.0767	0.0003
611.76	0.40	0.00	0.9241	0.0759	0.0003
611.75	0.39	0.00	0.9249	0.0751	0.0003
611.74	0.39	0.00	0.9257	0.0743	0.0003



611.73	0.39	0.00	0.9265	0.0735	0.0003
611.72	0.39	0.00	0.9273	0.0727	0.0003
611.71	0.39	0.00	0.9281	0.0719	0.0003
611.70	0.38	0.00	0.9289	0.0711	0.0003
611.69	0.38	0.00	0.9297	0.0703	0.0003
611.68	0.38	0.00	0.9305	0.0695	0.0003
611.67	0.38	0.00	0.9313	0.0687	0.0003
611.66	0.37	0.00	0.9321	0.0679	0.0003
611.65	0.37	0.00	0.9329	0.0671	0.0003
611.64	0.37	0.00	0.9337	0.0663	0.0003
611.63	0.37	0.00	0.9345	0.0655	0.0003
611.62	0.36	0.00	0.9352	0.0648	0.0003
611.61	0.36	0.00	0.9360	0.0640	0.0003
611.60	0.36	0.00	0.9368	0.0632	0.0003
611.59	0.36	0.00	0.9376	0.0624	0.0003
611.58	0.36	0.00	0.9383	0.0617	0.0002
611.57	0.35	0.00	0.9391	0.0609	0.0002
611.56	0.35	0.00	0.9398	0.0602	0.0002
611.55	0.35	0.00	0.9406	0.0594	0.0002
611.54	0.35	0.00	0.9413	0.0587	0.0002
611.53	0.34	0.00	0.9421	0.0579	0.0002
611.52	0.34	0.00	0.9428	0.0572	0.0002
611.51	0.34	0.00	0.9436	0.0564	0.0002
611.50	0.34	0.00	0.9443	0.0557	0.0002
611.49	0.33	0.00	0.9450	0.0550	0.0002
611.48	0.33	0.00	0.9457	0.0543	0.0002
611.47	0.33	0.00	0.9465	0.0535	0.0002
611.46	0.33	0.00	0.9472	0.0528	0.0002
611.45	0.33	0.00	0.9479	0.0521	0.0002
611.44	0.32	0.00	0.9486	0.0514	0.0002
611.43	0.32	0.00	0.9493	0.0507	0.0002
611.42	0.32	0.00	0.9500	0.0500	0.0002
611.41	0.32	0.00	0.9507	0.0493	0.0002
611.40	0.31	0.00	0.9514	0.0486	0.0002
611.39	0.31	0.00	0.9521	0.0479	0.0002
611.38	0.31	0.00	0.9528	0.0472	0.0002
611.37	0.31	0.00	0.9535	0.0465	0.0002
611.36	0.30	0.00	0.9541	0.0459	0.0002
611.35	0.30	0.00	0.9548	0.0452	0.0002
611.34	0.30	0.00	0.9555	0.0445	0.0002
611.33	0.30	0.00	0.9562	0.0438	0.0002
611.32	0.30	0.00	0.9568	0.0432	0.0002
611.31	0.29	0.00	0.9575	0.0425	0.0002
611.30	0.29	0.00	0.9581	0.0419	0.0002
611.29	0.29	0.00	0.9588	0.0412	0.0002
611.28	0.29	0.00	0.9594	0.0406	0.0002
611.27	0.28	0.00	0.9601	0.0399	0.0002
611.26	0.28	0.00	0.9607	0.0393	0.0002
611.25	0.28	0.00	0.9613	0.0387	0.0002
611.24	0.28	0.00	0.9620	0.0380	0.0002
611.23	0.27	0.00	0.9626	0.0374	0.0002
611.22	0.27	0.00	0.9632	0.0368	0.0001
611.21	0.27	0.00	0.9638	0.0362	0.0001
611.20	0.27	0.00	0.9644	0.0356	0.0001
611.19	0.27	0.00	0.9650	0.0350	0.0001
611.18	0.26	0.00	0.9656	0.0344	0.0001
611.17	0.26	0.00	0.9662	0.0338	0.0001
611.16	0.26	0.00	0.9668	0.0332	0.0001
611.15	0.26	0.00	0.9674	0.0326	0.0001
611.14	0.25	0.00	0.9680	0.0320	0.0001
611.13	0.25	0.00	0.9686	0.0314	0.0001
611.12	0.25	0.00	0.9691	0.0309	0.0001
611.11	0.25	0.00	0.9697	0.0303	0.0001
611.10	0.24	0.00	0.9703	0.0297	0.0001
611.09	0.24	0.00	0.9708	0.0292	0.0001
611.08	0.24	0.00	0.9714	0.0286	0.0001
611.07	0.24	0.00	0.9719	0.0281	0.0001
611.06	0.24	0.00	0.9725	0.0275	0.0001
611.05	0.23	0.00	0.9730	0.0270	0.0001
611.04	0.23	0.00	0.9735	0.0265	0.0001
611.03	0.23	0.00	0.9741	0.0259	0.0001
611.02	0.23	0.00	0.9746	0.0254	0.0001
611.01	0.22	0.00	0.9751	0.0249	0.0001
611.00	0.22	0.00	0.9756	0.0244	0.0001
610.99	0.22	0.00	0.9761	0.0239	0.0001
610.98	0.22	0.00	0.9766	0.0234	0.0001
610.97	0.22	0.00	0.9771	0.0229	0.0001
610.96	0.21	0.00	0.9776	0.0224	0.0001
610.95	0.21	0.00	0.9781	0.0219	0.0001

610.94	0.21	0.00	0.9786	0.0214	0.0001
610.93	0.21	0.00	0.9791	0.0209	0.0001
610.92	0.20	0.00	0.9795	0.0205	0.0001
610.91	0.20	0.00	0.9800	0.0200	0.0001
610.90	0.20	0.00	0.9805	0.0195	0.0001
610.89	0.20	0.00	0.9809	0.0191	0.0001
610.88	0.19	0.00	0.9814	0.0186	0.0001
610.87	0.19	0.00	0.9818	0.0182	0.0001
610.86	0.19	0.00	0.9823	0.0177	0.0001
610.85	0.19	0.00	0.9827	0.0173	0.0001
610.84	0.19	0.00	0.9831	0.0169	0.0001
610.83	0.18	0.00	0.9836	0.0164	0.0001
610.82	0.18	0.00	0.9840	0.0160	0.0001
610.81	0.18	0.00	0.9844	0.0156	0.0001
610.80	0.18	0.00	0.9848	0.0152	0.0001
610.79	0.17	0.00	0.9852	0.0148	0.0001
610.78	0.17	0.00	0.9856	0.0144	0.0001
610.77	0.17	0.00	0.9860	0.0140	0.0001
610.76	0.17	0.00	0.9864	0.0136	0.0001
610.75	0.16	0.00	0.9868	0.0132	0.0001
610.74	0.16	0.00	0.9871	0.0129	0.0001
610.73	0.16	0.00	0.9875	0.0125	0.0001
610.72	0.16	0.00	0.9879	0.0121	0.0000
610.71	0.16	0.00	0.9882	0.0118	0.0000
610.70	0.15	0.00	0.9886	0.0114	0.0000
610.69	0.15	0.00	0.9890	0.0110	0.0000
610.68	0.15	0.00	0.9893	0.0107	0.0000
610.67	0.15	0.00	0.9896	0.0104	0.0000
610.66	0.14	0.00	0.9900	0.0100	0.0000
610.65	0.14	0.00	0.9903	0.0097	0.0000
610.64	0.14	0.00	0.9906	0.0094	0.0000
610.63	0.14	0.00	0.9909	0.0091	0.0000
610.62	0.13	0.00	0.9913	0.0087	0.0000
610.61	0.13	0.00	0.9916	0.0084	0.0000
610.60	0.13	0.00	0.9919	0.0081	0.0000
610.59	0.13	0.00	0.9922	0.0078	0.0000
610.58	0.13	0.00	0.9924	0.0076	0.0000
610.57	0.12	0.00	0.9927	0.0073	0.0000
610.56	0.12	0.00	0.9930	0.0070	0.0000
610.55	0.12	0.00	0.9933	0.0067	0.0000
610.54	0.12	0.00	0.9935	0.0065	0.0000
610.53	0.11	0.00	0.9938	0.0062	0.0000
610.52	0.11	0.00	0.9941	0.0059	0.0000
610.51	0.11	0.00	0.9943	0.0057	0.0000
610.50	0.11	0.00	0.9946	0.0054	0.0000
610.49	0.10	0.00	0.9948	0.0052	0.0000
610.48	0.10	0.00	0.9950	0.0050	0.0000
610.47	0.10	0.00	0.9953	0.0047	0.0000
610.46	0.10	0.00	0.9955	0.0045	0.0000
610.45	0.10	0.00	0.9957	0.0043	0.0000
610.44	0.09	0.00	0.9959	0.0041	0.0000
610.43	0.09	0.00	0.9961	0.0039	0.0000
610.42	0.09	0.00	0.9963	0.0037	0.0000
610.41	0.09	0.00	0.9965	0.0035	0.0000
610.40	0.08	0.00	0.9967	0.0033	0.0000
610.39	0.08	0.00	0.9969	0.0031	0.0000
610.38	0.08	0.00	0.9971	0.0029	0.0000
610.37	0.08	0.00	0.9973	0.0027	0.0000
610.36	0.07	0.00	0.9974	0.0026	0.0000
610.35	0.07	0.00	0.9976	0.0024	0.0000
610.34	0.07	0.00	0.9977	0.0023	0.0000
610.33	0.07	0.00	0.9979	0.0021	0.0000
610.32	0.07	0.00	0.9980	0.0020	0.0000
610.31	0.06	0.00	0.9982	0.0018	0.0000
610.30	0.06	0.00	0.9983	0.0017	0.0000
610.29	0.06	0.00	0.9984	0.0016	0.0000
610.28	0.06	0.00	0.9986	0.0014	0.0000
610.27	0.05	0.00	0.9987	0.0013	0.0000
610.26	0.05	0.00	0.9988	0.0012	0.0000
610.25	0.05	0.00	0.9989	0.0011	0.0000
610.24	0.05	0.00	0.9990	0.0010	0.0000
610.23	0.05	0.00	0.9991	0.0009	0.0000
610.22	0.04	0.00	0.9992	0.0008	0.0000
610.21	0.04	0.00	0.9993	0.0007	0.0000
610.20	0.04	0.00	0.9994	0.0006	0.0000
610.19	0.04	0.00	0.9995	0.0005	0.0000
610.18	0.03	0.00	0.9995	0.0005	0.0000
610.17	0.03	0.00	0.9996	0.0004	0.0000
610.16	0.03	0.00	0.9996	0.0004	0.0000

	610.15	0.03	0.00	0.9997	0.0003	0.0000
	610.14	0.02	0.00	0.9998	0.0002	0.0000
	610.13	0.02	0.00	0.9998	0.0002	0.0000
	610.12	0.02	0.00	0.9998	0.0002	0.0000
	610.11	0.02	0.00	0.9999	0.0001	0.0000
	610.10	0.02	0.00	0.9999	0.0001	0.0000
	610.09	0.01	0.00	0.9999	0.0001	0.0000
	610.08	0.01	0.00	1.0000	0.0000	0.0000
	610.07	0.01	0.00	1.0000	0.0000	0.0000
	610.06	0.01	0.00	1.0000	0.0000	0.0000
	610.05	0.00	0.00	1.0000	0.0000	0.0000
	610.04	0.00	0.00	1.0000	0.0000	0.0000
Zow =	610.03	0.00	0.00	1.0000	0.0000	0.0000

Oil Specific Volume      0.1135    ft<sup>3</sup>/ft<sup>2</sup>

Data Entry Worksheet for Soil Samples -- Oil Specific Volume (OSV) Calculations

Project No. = 406   = User must enter the soil or fluid parameter, or lab data, as appropriate  
 Boring Designation = LRMW-4

Soil Parameters

Fluid Parameters

Oil Parameters

Required to Estimate OSV - Soil

Required to Estimate OSV - Soil

$\rho_b = 1.59 \text{ g/cm}^3$  Bulk density of soil

$\rho_o = 0.7702 \text{ g/cm}^3$  Oil density

Soil Sample Data

Sample Intervals (maximum 21 samples)

	Feet (bgs)	to	Feet (bgs)	GRO or DRO (mg/kg)
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				

Deepest sample must be entered in this row

Data Entry Worksheet for Monitoring Well Fluid Data -- Oil Specific Volume (OSV) Calculations

Project No. = 406  
Boring Designation = LRMW-4

[ ] = User must enter the soil or fluid parameter, or lab data, as appropriate

Soil Parameters

Required to Estimate OSV - MWs

$\phi$  = 0.403 Total porosity  
 $\sigma_{ow}$  = 17.89 dynes/cm Oil/Water Interfacial Tension  
 $\sigma_{ao}$  = 21.82 dynes/cm Air/Oil Surface Tension  
 $\sigma_{aw}$  = 62.44 dynes/cm Air/Water Surface Tension  
 $\alpha$  = 0.312 /foot Van Genuchten mean pore-size parameter  
 $n$  = 2.10000 Van Genuchten pore-size distribution exponent  
 $S_m$  = 0.046 Irreducible water saturation

Fluid Parameters

$\rho_{ro}$  = 0.7702 Ratio of oil to water density  
 $\beta_{ao}$  = 2.86 Ratio of water surface tension to oil surface tension  
 $\beta_{ow}$  = 3.49 Ratio of water surface tension to oil-water interfacial tension  
 $Z_{ow}$  = 17.03 feet Depth to oil/air interface  
 $Z_{ao}$  = 18.8 feet Depth to oil/water interface  
 $S_m$  = 0.046 Water saturation at field capacity  
 $\alpha$  = 0.312 /foot Van Genuchten mean pore-size parameter  
 $n$  = 2.10000 Van Genuchten pore-size distribution exponent  
 $m$  = 0.047619 Calculated from "n" (Burdine)  
 $dZ$  = 0.01 feet Integration increment (0.01 to 1.0)  
TOC = 628.53 feet Elevation of TOC or measuring point



Oil Specific Volume Calculation Spreadsheet for Free-phase Hydrocarbon in Monitoring Wells

Project No. 406  
Boring Designation LRMW-4

**DO NOT CHANGE ANY CELLS ON THIS WORKSHEET**

Z (feet)	h <sub>ow</sub> (feet)	h <sub>ao</sub> (feet)	S <sub>w</sub> (--)	S <sub>of</sub> (--)	φ S <sub>of</sub> dZ (ft <sup>3</sup> /ft <sup>2</sup> )
Z <sub>u</sub> = 612.51	0.64	0.78	0.8263	0.0000	0.0000
612.50	0.64	0.77	0.8273	0.0017	0.0000
612.49	0.63	0.76	0.8283	0.0034	0.0000
612.48	0.63	0.76	0.8293	0.0051	0.0000
612.47	0.63	0.75	0.8302	0.0069	0.0000
612.46	0.63	0.74	0.8312	0.0086	0.0000
612.45	0.63	0.73	0.8322	0.0103	0.0000
612.44	0.62	0.73	0.8332	0.0120	0.0000
612.43	0.62	0.72	0.8342	0.0137	0.0001
612.42	0.62	0.71	0.8352	0.0153	0.0001
612.41	0.62	0.70	0.8361	0.0170	0.0001
612.40	0.61	0.70	0.8371	0.0187	0.0001
612.39	0.61	0.69	0.8381	0.0204	0.0001
612.38	0.61	0.68	0.8391	0.0220	0.0001
612.37	0.61	0.67	0.8400	0.0237	0.0001
612.36	0.60	0.66	0.8410	0.0253	0.0001
612.35	0.60	0.66	0.8420	0.0270	0.0001
612.34	0.60	0.65	0.8430	0.0286	0.0001
612.33	0.60	0.64	0.8439	0.0302	0.0001
612.32	0.60	0.63	0.8449	0.0318	0.0001
612.31	0.59	0.63	0.8459	0.0334	0.0001
612.30	0.59	0.62	0.8469	0.0350	0.0001
612.29	0.59	0.61	0.8478	0.0366	0.0001
612.28	0.59	0.60	0.8488	0.0382	0.0002
612.27	0.58	0.60	0.8498	0.0397	0.0002
612.26	0.58	0.59	0.8508	0.0412	0.0002
612.25	0.58	0.58	0.8517	0.0428	0.0002
612.24	0.58	0.57	0.8527	0.0443	0.0002
612.23	0.58	0.56	0.8537	0.0458	0.0002
612.22	0.57	0.56	0.8546	0.0473	0.0002
612.21	0.57	0.55	0.8556	0.0487	0.0002
612.20	0.57	0.54	0.8566	0.0502	0.0002
612.19	0.57	0.53	0.8575	0.0516	0.0002
612.18	0.56	0.53	0.8585	0.0530	0.0002
612.17	0.56	0.52	0.8594	0.0544	0.0002
612.16	0.56	0.51	0.8604	0.0558	0.0002
612.15	0.56	0.50	0.8614	0.0571	0.0002
612.14	0.55	0.49	0.8623	0.0585	0.0002
612.13	0.55	0.49	0.8633	0.0598	0.0002
612.12	0.55	0.48	0.8642	0.0611	0.0002
612.11	0.55	0.47	0.8652	0.0624	0.0003
612.10	0.55	0.46	0.8661	0.0636	0.0003
612.09	0.54	0.46	0.8671	0.0648	0.0003
612.08	0.54	0.45	0.8680	0.0660	0.0003
612.07	0.54	0.44	0.8690	0.0672	0.0003
612.06	0.54	0.43	0.8699	0.0684	0.0003
612.05	0.53	0.43	0.8709	0.0695	0.0003
612.04	0.53	0.42	0.8718	0.0706	0.0003
612.03	0.53	0.41	0.8728	0.0717	0.0003
612.02	0.53	0.40	0.8737	0.0727	0.0003
612.01	0.52	0.39	0.8747	0.0738	0.0003
612.00	0.52	0.39	0.8756	0.0747	0.0003
611.99	0.52	0.38	0.8765	0.0757	0.0003
611.98	0.52	0.37	0.8775	0.0766	0.0003
611.97	0.52	0.36	0.8784	0.0776	0.0003
611.96	0.51	0.36	0.8794	0.0784	0.0003
611.95	0.51	0.35	0.8803	0.0793	0.0003
611.94	0.51	0.34	0.8812	0.0801	0.0003
611.93	0.51	0.33	0.8822	0.0809	0.0003
611.92	0.50	0.33	0.8831	0.0816	0.0003
611.91	0.50	0.32	0.8840	0.0823	0.0003
611.90	0.50	0.31	0.8849	0.0830	0.0003
611.89	0.50	0.30	0.8859	0.0837	0.0003
611.88	0.49	0.29	0.8868	0.0843	0.0003
611.87	0.49	0.29	0.8877	0.0849	0.0003
611.86	0.49	0.28	0.8886	0.0854	0.0003
611.85	0.49	0.27	0.8895	0.0859	0.0003

$$Z_u = \rho_{ro} \beta_{ao} H_o / [\rho_{ro} \beta_{ao} - (1 - \rho_{ro}) \beta_{ow}]$$

= 612.51 feet

where:

ρ<sub>ro</sub> = 0.7702

β<sub>ao</sub> = 2.86

β<sub>ow</sub> = 3.49

H<sub>o</sub> = 1.77 feet

Z<sub>ow</sub> = 609.73 feet

Z<sub>ao</sub> = 611.5 feet

Other parameters used in calculations (from Data Entry - MWs)

S<sub>m</sub> = 0.046

α = 0.312 /foot

n = 2.1

m = 0.047619048

dZ = 0.01 feet      Integration increment (0.01 to 1.0)

φ = 0.403

Oil Specific Volume

Σφ S<sub>of</sub> dZ = 4.4785E-02 ft<sup>3</sup>/ft<sup>2</sup>      Oil Specific Volume

611.84	0.49	0.26	0.8904	0.0864	0.0003
611.83	0.48	0.26	0.8914	0.0868	0.0003
611.82	0.48	0.25	0.8923	0.0872	0.0004
611.81	0.48	0.24	0.8932	0.0876	0.0004
611.80	0.48	0.23	0.8941	0.0879	0.0004
611.79	0.47	0.23	0.8950	0.0882	0.0004
611.78	0.47	0.22	0.8959	0.0885	0.0004
611.77	0.47	0.21	0.8968	0.0887	0.0004
611.76	0.47	0.20	0.8977	0.0889	0.0004
611.75	0.46	0.19	0.8986	0.0890	0.0004
611.74	0.46	0.19	0.8995	0.0891	0.0004
611.73	0.46	0.18	0.9004	0.0892	0.0004
611.72	0.46	0.17	0.9013	0.0892	0.0004
611.71	0.46	0.16	0.9022	0.0892	0.0004
611.70	0.45	0.16	0.9030	0.0891	0.0004
611.69	0.45	0.15	0.9039	0.0890	0.0004
611.68	0.45	0.14	0.9048	0.0889	0.0004
611.67	0.45	0.13	0.9057	0.0887	0.0004
611.66	0.44	0.13	0.9066	0.0885	0.0004
611.65	0.44	0.12	0.9074	0.0882	0.0004
611.64	0.44	0.11	0.9083	0.0879	0.0004
611.63	0.44	0.10	0.9092	0.0876	0.0004
611.62	0.43	0.09	0.9100	0.0872	0.0004
611.61	0.43	0.09	0.9109	0.0868	0.0003
611.60	0.43	0.08	0.9118	0.0863	0.0003
611.59	0.43	0.07	0.9126	0.0858	0.0003
611.58	0.43	0.06	0.9135	0.0853	0.0003
611.57	0.42	0.06	0.9143	0.0847	0.0003
611.56	0.42	0.05	0.9152	0.0841	0.0003
611.55	0.42	0.04	0.9160	0.0835	0.0003
611.54	0.42	0.03	0.9169	0.0828	0.0003
611.53	0.41	0.03	0.9177	0.0821	0.0003
611.52	0.41	0.02	0.9186	0.0814	0.0003
611.51	0.41	0.01	0.9194	0.0806	0.0003
611.50	0.41	0.00	0.9202	0.0798	0.0003
611.49	0.41	0.00	0.9211	0.0789	0.0003
611.48	0.40	0.00	0.9219	0.0781	0.0003
611.47	0.40	0.00	0.9227	0.0773	0.0003
611.46	0.40	0.00	0.9235	0.0765	0.0003
611.45	0.40	0.00	0.9244	0.0756	0.0003
611.44	0.39	0.00	0.9252	0.0748	0.0003
611.43	0.39	0.00	0.9260	0.0740	0.0003
611.42	0.39	0.00	0.9268	0.0732	0.0003
611.41	0.39	0.00	0.9276	0.0724	0.0003
611.40	0.38	0.00	0.9284	0.0716	0.0003
611.39	0.38	0.00	0.9292	0.0708	0.0003
611.38	0.38	0.00	0.9300	0.0700	0.0003
611.37	0.38	0.00	0.9308	0.0692	0.0003
611.36	0.38	0.00	0.9316	0.0684	0.0003
611.35	0.37	0.00	0.9324	0.0676	0.0003
611.34	0.37	0.00	0.9332	0.0668	0.0003
611.33	0.37	0.00	0.9340	0.0660	0.0003
611.32	0.37	0.00	0.9347	0.0653	0.0003
611.31	0.36	0.00	0.9355	0.0645	0.0003
611.30	0.36	0.00	0.9363	0.0637	0.0003
611.29	0.36	0.00	0.9370	0.0630	0.0003
611.28	0.36	0.00	0.9378	0.0622	0.0003
611.27	0.35	0.00	0.9386	0.0614	0.0002
611.26	0.35	0.00	0.9393	0.0607	0.0002
611.25	0.35	0.00	0.9401	0.0599	0.0002
611.24	0.35	0.00	0.9408	0.0592	0.0002
611.23	0.35	0.00	0.9416	0.0584	0.0002
611.22	0.34	0.00	0.9423	0.0577	0.0002
611.21	0.34	0.00	0.9431	0.0569	0.0002
611.20	0.34	0.00	0.9438	0.0562	0.0002
611.19	0.34	0.00	0.9445	0.0555	0.0002
611.18	0.33	0.00	0.9453	0.0547	0.0002
611.17	0.33	0.00	0.9460	0.0540	0.0002
611.16	0.33	0.00	0.9467	0.0533	0.0002
611.15	0.33	0.00	0.9474	0.0526	0.0002
611.14	0.32	0.00	0.9481	0.0519	0.0002
611.13	0.32	0.00	0.9488	0.0512	0.0002
611.12	0.32	0.00	0.9496	0.0504	0.0002
611.11	0.32	0.00	0.9503	0.0497	0.0002
611.10	0.32	0.00	0.9509	0.0491	0.0002
611.09	0.31	0.00	0.9516	0.0484	0.0002
611.08	0.31	0.00	0.9523	0.0477	0.0002
611.07	0.31	0.00	0.9530	0.0470	0.0002
611.06	0.31	0.00	0.9537	0.0463	0.0002



611.05	0.30	0.00	0.9544	0.0456	0.0002
611.04	0.30	0.00	0.9550	0.0450	0.0002
611.03	0.30	0.00	0.9557	0.0443	0.0002
611.02	0.30	0.00	0.9564	0.0436	0.0002
611.01	0.29	0.00	0.9570	0.0430	0.0002
611.00	0.29	0.00	0.9577	0.0423	0.0002
610.99	0.29	0.00	0.9583	0.0417	0.0002
610.98	0.29	0.00	0.9590	0.0410	0.0002
610.97	0.29	0.00	0.9596	0.0404	0.0002
610.96	0.28	0.00	0.9603	0.0397	0.0002
610.95	0.28	0.00	0.9609	0.0391	0.0002
610.94	0.28	0.00	0.9615	0.0385	0.0002
610.93	0.28	0.00	0.9622	0.0378	0.0002
610.92	0.27	0.00	0.9628	0.0372	0.0001
610.91	0.27	0.00	0.9634	0.0366	0.0001
610.90	0.27	0.00	0.9640	0.0360	0.0001
610.89	0.27	0.00	0.9646	0.0354	0.0001
610.88	0.26	0.00	0.9652	0.0348	0.0001
610.87	0.26	0.00	0.9658	0.0342	0.0001
610.86	0.26	0.00	0.9664	0.0336	0.0001
610.85	0.26	0.00	0.9670	0.0330	0.0001
610.84	0.26	0.00	0.9676	0.0324	0.0001
610.83	0.25	0.00	0.9682	0.0318	0.0001
610.82	0.25	0.00	0.9687	0.0313	0.0001
610.81	0.25	0.00	0.9693	0.0307	0.0001
610.80	0.25	0.00	0.9699	0.0301	0.0001
610.79	0.24	0.00	0.9704	0.0296	0.0001
610.78	0.24	0.00	0.9710	0.0290	0.0001
610.77	0.24	0.00	0.9715	0.0285	0.0001
610.76	0.24	0.00	0.9721	0.0279	0.0001
610.75	0.23	0.00	0.9726	0.0274	0.0001
610.74	0.23	0.00	0.9732	0.0268	0.0001
610.73	0.23	0.00	0.9737	0.0263	0.0001
610.72	0.23	0.00	0.9742	0.0258	0.0001
610.71	0.23	0.00	0.9747	0.0253	0.0001
610.70	0.22	0.00	0.9753	0.0247	0.0001
610.69	0.22	0.00	0.9758	0.0242	0.0001
610.68	0.22	0.00	0.9763	0.0237	0.0001
610.67	0.22	0.00	0.9768	0.0232	0.0001
610.66	0.21	0.00	0.9773	0.0227	0.0001
610.65	0.21	0.00	0.9778	0.0222	0.0001
610.64	0.21	0.00	0.9783	0.0217	0.0001
610.63	0.21	0.00	0.9787	0.0213	0.0001
610.62	0.21	0.00	0.9792	0.0208	0.0001
610.61	0.20	0.00	0.9797	0.0203	0.0001
610.60	0.20	0.00	0.9802	0.0198	0.0001
610.59	0.20	0.00	0.9806	0.0194	0.0001
610.58	0.20	0.00	0.9811	0.0189	0.0001
610.57	0.19	0.00	0.9815	0.0185	0.0001
610.56	0.19	0.00	0.9820	0.0180	0.0001
610.55	0.19	0.00	0.9824	0.0176	0.0001
610.54	0.19	0.00	0.9828	0.0172	0.0001
610.53	0.18	0.00	0.9833	0.0167	0.0001
610.52	0.18	0.00	0.9837	0.0163	0.0001
610.51	0.18	0.00	0.9841	0.0159	0.0001
610.50	0.18	0.00	0.9845	0.0155	0.0001
610.49	0.18	0.00	0.9849	0.0151	0.0001
610.48	0.17	0.00	0.9853	0.0147	0.0001
610.47	0.17	0.00	0.9857	0.0143	0.0001
610.46	0.17	0.00	0.9861	0.0139	0.0001
610.45	0.17	0.00	0.9865	0.0135	0.0001
610.44	0.16	0.00	0.9869	0.0131	0.0001
610.43	0.16	0.00	0.9873	0.0127	0.0001
610.42	0.16	0.00	0.9876	0.0124	0.0000
610.41	0.16	0.00	0.9880	0.0120	0.0000
610.40	0.15	0.00	0.9884	0.0116	0.0000
610.39	0.15	0.00	0.9887	0.0113	0.0000
610.38	0.15	0.00	0.9891	0.0109	0.0000
610.37	0.15	0.00	0.9894	0.0106	0.0000
610.36	0.15	0.00	0.9897	0.0103	0.0000
610.35	0.14	0.00	0.9901	0.0099	0.0000
610.34	0.14	0.00	0.9904	0.0096	0.0000
610.33	0.14	0.00	0.9907	0.0093	0.0000
610.32	0.14	0.00	0.9910	0.0090	0.0000
610.31	0.13	0.00	0.9914	0.0086	0.0000
610.30	0.13	0.00	0.9917	0.0083	0.0000
610.29	0.13	0.00	0.9920	0.0080	0.0000
610.28	0.13	0.00	0.9923	0.0077	0.0000
610.27	0.12	0.00	0.9925	0.0075	0.0000





Data Entry Worksheet for Soil Samples -- Oil Specific Volume (OSV) Calculations

Project No. = 406 [ ] = User must enter the soil or fluid parameter, or lab data, as appropriate  
Boring Designation = LRMW-5

Soil Parameters

Fluid Parameters

Oil Parameters

Required to Estimate OSV - Soil

Required to Estimate OSV - Soil

$\rho_b = 1.59 \text{ g/cm}^3$  Bulk density of soil

$\rho_o = 0.7702 \text{ g/cm}^3$  Oil density

Soil Sample Data

Sample Intervals (maximum 21 samples)

	Feet (bgs)	to	Feet (bgs)	GRO or DRO (mg/kg)
1	[ ]		[ ]	[ ]
2	[ ]		[ ]	[ ]
3	[ ]		[ ]	[ ]
4	[ ]		[ ]	[ ]
5	[ ]		[ ]	[ ]
6	[ ]		[ ]	[ ]
7	[ ]		[ ]	[ ]
8	[ ]		[ ]	[ ]
9	[ ]		[ ]	[ ]
10	[ ]		[ ]	[ ]
11	[ ]		[ ]	[ ]
12	[ ]		[ ]	[ ]
13	[ ]		[ ]	[ ]
14	[ ]		[ ]	[ ]
15	[ ]		[ ]	[ ]
16	[ ]		[ ]	[ ]
17	[ ]		[ ]	[ ]
18	[ ]		[ ]	[ ]
19	[ ]		[ ]	[ ]
20	[ ]		[ ]	[ ]
21	[ ]		[ ]	[ ]

Deepest sample must be entered in this row

## Data Entry Worksheet for Monitoring Well Fluid Data -- Oil Specific Volume (OSV) Calculations

Project No. = 406  
Boring Designation = LRMW-5

= User must enter the soil or fluid parameter, or lab data, as appropriate

### Soil Parameters

#### Required to Estimate OSV - MWs

$\phi$  = 0.403 Total porosity  
 $\sigma_{ow}$  = 17.89 dynes/cm Oil/Water Interfacial Tension  
 $\sigma_{ao}$  = 21.82 dynes/cm Air/Oil Surface Tension  
 $\sigma_{aw}$  = 62.44 dynes/cm Air/Water Surface Tension  
 $\alpha$  = 0.312 /foot Van Genuchten mean pore-size parameter  
 $n$  = 2.10000 Van Genuchten pore-size distribution exponent  
 $S_m$  = 0.046 Irreducible water saturation

### Fluid Parameters

$\rho_{ro}$  = 0.7702 Ratio of oil to water density  
 $\beta_{ao}$  = 2.86 Ratio of water surface tension to oil surface tension  
 $\beta_{ow}$  = 3.49 Ratio of water surface tension to oil-water interfacial tension  
 $Z_{ow}$  = 17.52 feet Depth to oil/air interface  
 $Z_{ao}$  = 19.46 feet Depth to oil/water interface  
 $S_m$  = 0.046 Water saturation at field capacity  
 $\alpha$  = 0.312 /foot Van Genuchten mean pore-size parameter  
 $n$  = 2.10000 Van Genuchten pore-size distribution exponent  
 $m$  = 0.047619 Calculated from "n" (Burdine)  
 $dZ$  = 0.01 feet Integration increment (0.01 to 1.0)  
TOC = 629.2 feet Elevation of TOC or measuring point

Oil Specific Volume Calculation Spreadsheet for Soil Samples

Project No. 406  
Boring Designation LRMW-5

Depth (feet)	dZ (feet)	GRO or DRO (mg/kg)	$\theta_o$ (-)	$V_o$ (ft <sup>3</sup> /ft <sup>2</sup> )
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000

Oil Specific Volume = 0.000

**DO NOT CHANGE ANY CELLS ON THIS WORKSHEET**

Oil Specific Volume Calculation Spreadsheet for Free-phase Hydrocarbon in Monitoring Wells

Project No. 406  
Boring Designation LRMW-5

**DO NOT CHANGE ANY CELLS ON THIS WORKSHEET**

Z (feet)	h <sub>ow</sub> (feet)	h <sub>ao</sub> (feet)	S <sub>w</sub> (--)	S <sub>of</sub> (--)	φ S <sub>of</sub> dZ (ft <sup>3</sup> /ft <sup>2</sup> )
Z <sub>u</sub> = 612.79	0.70	0.85	0.8000	0.0000	0.0000
612.78	0.70	0.85	0.8010	0.0017	0.0000
612.77	0.70	0.84	0.8020	0.0034	0.0000
612.76	0.69	0.83	0.8030	0.0052	0.0000
612.75	0.69	0.82	0.8039	0.0069	0.0000
612.74	0.69	0.82	0.8049	0.0086	0.0000
612.73	0.69	0.81	0.8059	0.0103	0.0000
612.72	0.68	0.80	0.8069	0.0121	0.0000
612.71	0.68	0.79	0.8079	0.0138	0.0001
612.70	0.68	0.79	0.8089	0.0155	0.0001
612.69	0.68	0.78	0.8099	0.0172	0.0001
612.68	0.68	0.77	0.8108	0.0189	0.0001
612.67	0.67	0.76	0.8118	0.0206	0.0001
612.66	0.67	0.75	0.8128	0.0223	0.0001
612.65	0.67	0.75	0.8138	0.0240	0.0001
612.64	0.67	0.74	0.8148	0.0257	0.0001
612.63	0.66	0.73	0.8158	0.0274	0.0001
612.62	0.66	0.72	0.8168	0.0291	0.0001
612.61	0.66	0.72	0.8177	0.0308	0.0001
612.60	0.66	0.71	0.8187	0.0325	0.0001
612.59	0.65	0.70	0.8197	0.0342	0.0001
612.58	0.65	0.69	0.8207	0.0358	0.0001
612.57	0.65	0.69	0.8217	0.0375	0.0002
612.56	0.65	0.68	0.8227	0.0392	0.0002
612.55	0.65	0.67	0.8236	0.0408	0.0002
612.54	0.64	0.66	0.8246	0.0424	0.0002
612.53	0.64	0.65	0.8256	0.0441	0.0002
612.52	0.64	0.65	0.8266	0.0457	0.0002
612.51	0.64	0.64	0.8276	0.0473	0.0002
612.50	0.63	0.63	0.8286	0.0489	0.0002
612.49	0.63	0.62	0.8295	0.0505	0.0002
612.48	0.63	0.62	0.8305	0.0521	0.0002
612.47	0.63	0.61	0.8315	0.0536	0.0002
612.46	0.63	0.60	0.8325	0.0552	0.0002
612.45	0.62	0.59	0.8335	0.0567	0.0002
612.44	0.62	0.59	0.8344	0.0582	0.0002
612.43	0.62	0.58	0.8354	0.0597	0.0002
612.42	0.62	0.57	0.8364	0.0612	0.0002
612.41	0.61	0.56	0.8374	0.0627	0.0003
612.40	0.61	0.55	0.8384	0.0642	0.0003
612.39	0.61	0.55	0.8393	0.0656	0.0003
612.38	0.61	0.54	0.8403	0.0671	0.0003
612.37	0.60	0.53	0.8413	0.0685	0.0003
612.36	0.60	0.52	0.8423	0.0699	0.0003
612.35	0.60	0.52	0.8432	0.0712	0.0003
612.34	0.60	0.51	0.8442	0.0726	0.0003
612.33	0.60	0.50	0.8452	0.0739	0.0003
612.32	0.59	0.49	0.8462	0.0753	0.0003
612.31	0.59	0.49	0.8471	0.0765	0.0003
612.30	0.59	0.48	0.8481	0.0778	0.0003
612.29	0.59	0.47	0.8491	0.0791	0.0003
612.28	0.58	0.46	0.8500	0.0803	0.0003
612.27	0.58	0.45	0.8510	0.0815	0.0003
612.26	0.58	0.45	0.8520	0.0827	0.0003
612.25	0.58	0.44	0.8530	0.0838	0.0003
612.24	0.57	0.43	0.8539	0.0850	0.0003
612.23	0.57	0.42	0.8549	0.0861	0.0003
612.22	0.57	0.42	0.8559	0.0871	0.0004
612.21	0.57	0.41	0.8568	0.0882	0.0004
612.20	0.57	0.40	0.8578	0.0892	0.0004
612.19	0.56	0.39	0.8587	0.0902	0.0004
612.18	0.56	0.39	0.8597	0.0912	0.0004
612.17	0.56	0.38	0.8607	0.0921	0.0004
612.16	0.56	0.37	0.8616	0.0930	0.0004
612.15	0.55	0.36	0.8626	0.0939	0.0004
612.14	0.55	0.35	0.8635	0.0947	0.0004
612.13	0.55	0.35	0.8645	0.0956	0.0004

$$Z_u = \rho_{ro} \beta_{ao} H_o / [\rho_{ro} \beta_{ao} - (1 - \rho_{ro}) \beta_{ow}]$$

= 612.79 feet

where:

ρ<sub>ro</sub> = 0.7702

β<sub>ao</sub> = 2.86

β<sub>ow</sub> = 3.49

H<sub>o</sub> = 1.94 feet

Z<sub>ow</sub> = 609.74 feet

Z<sub>ao</sub> = 611.68 feet

Other parameters used in calculations (from Data Entry - MWs)

S<sub>m</sub> = 0.046

α = 0.312 /foot

n = 2.1

m = 0.047619048

dZ = 0.01 feet      Integration increment (0.01 to 1.0)

φ = 0.403

Oil Specific Volume

Σφ S<sub>of</sub> dZ = 5.7585E-02 ft<sup>3</sup>/ft<sup>2</sup>      Oil Specific Volume

612.12	0.55	0.34	0.8654	0.0963	0.0004
612.11	0.54	0.33	0.8664	0.0971	0.0004
612.10	0.54	0.32	0.8674	0.0978	0.0004
612.09	0.54	0.32	0.8683	0.0985	0.0004
612.08	0.54	0.31	0.8693	0.0991	0.0004
612.07	0.54	0.30	0.8702	0.0997	0.0004
612.06	0.53	0.29	0.8712	0.1003	0.0004
612.05	0.53	0.28	0.8721	0.1009	0.0004
612.04	0.53	0.28	0.8730	0.1014	0.0004
612.03	0.53	0.27	0.8740	0.1019	0.0004
612.02	0.52	0.26	0.8749	0.1023	0.0004
612.01	0.52	0.25	0.8759	0.1027	0.0004
612.00	0.52	0.25	0.8768	0.1031	0.0004
611.99	0.52	0.24	0.8777	0.1034	0.0004
611.98	0.51	0.23	0.8787	0.1037	0.0004
611.97	0.51	0.22	0.8796	0.1039	0.0004
611.96	0.51	0.22	0.8805	0.1041	0.0004
611.95	0.51	0.21	0.8815	0.1043	0.0004
611.94	0.51	0.20	0.8824	0.1044	0.0004
611.93	0.50	0.19	0.8833	0.1045	0.0004
611.92	0.50	0.18	0.8843	0.1046	0.0004
611.91	0.50	0.18	0.8852	0.1046	0.0004
611.90	0.50	0.17	0.8861	0.1046	0.0004
611.89	0.49	0.16	0.8870	0.1045	0.0004
611.88	0.49	0.15	0.8879	0.1044	0.0004
611.87	0.49	0.15	0.8889	0.1043	0.0004
611.86	0.49	0.14	0.8898	0.1041	0.0004
611.85	0.48	0.13	0.8907	0.1038	0.0004
611.84	0.48	0.12	0.8916	0.1036	0.0004
611.83	0.48	0.12	0.8925	0.1033	0.0004
611.82	0.48	0.11	0.8934	0.1029	0.0004
611.81	0.48	0.10	0.8943	0.1026	0.0004
611.80	0.47	0.09	0.8952	0.1021	0.0004
611.79	0.47	0.08	0.8961	0.1017	0.0004
611.78	0.47	0.08	0.8970	0.1012	0.0004
611.77	0.47	0.07	0.8979	0.1006	0.0004
611.76	0.46	0.06	0.8988	0.1000	0.0004
611.75	0.46	0.05	0.8997	0.0994	0.0004
611.74	0.46	0.05	0.9006	0.0988	0.0004
611.73	0.46	0.04	0.9015	0.0981	0.0004
611.72	0.45	0.03	0.9024	0.0973	0.0004
611.71	0.45	0.02	0.9033	0.0966	0.0004
611.70	0.45	0.02	0.9042	0.0958	0.0004
611.69	0.45	0.01	0.9050	0.0949	0.0004
611.68	0.45	0.00	0.9059	0.0941	0.0004
611.67	0.44	0.00	0.9068	0.0932	0.0004
611.66	0.44	0.00	0.9077	0.0923	0.0004
611.65	0.44	0.00	0.9085	0.0915	0.0004
611.64	0.44	0.00	0.9094	0.0906	0.0004
611.63	0.43	0.00	0.9103	0.0897	0.0004
611.62	0.43	0.00	0.9111	0.0889	0.0004
611.61	0.43	0.00	0.9120	0.0880	0.0004
611.60	0.43	0.00	0.9129	0.0871	0.0004
611.59	0.43	0.00	0.9137	0.0863	0.0003
611.58	0.42	0.00	0.9146	0.0854	0.0003
611.57	0.42	0.00	0.9154	0.0846	0.0003
611.56	0.42	0.00	0.9163	0.0837	0.0003
611.55	0.42	0.00	0.9171	0.0829	0.0003
611.54	0.41	0.00	0.9179	0.0821	0.0003
611.53	0.41	0.00	0.9188	0.0812	0.0003
611.52	0.41	0.00	0.9196	0.0804	0.0003
611.51	0.41	0.00	0.9205	0.0795	0.0003
611.50	0.40	0.00	0.9213	0.0787	0.0003
611.49	0.40	0.00	0.9221	0.0779	0.0003
611.48	0.40	0.00	0.9229	0.0771	0.0003
611.47	0.40	0.00	0.9238	0.0762	0.0003
611.46	0.40	0.00	0.9246	0.0754	0.0003
611.45	0.39	0.00	0.9254	0.0746	0.0003
611.44	0.39	0.00	0.9262	0.0738	0.0003
611.43	0.39	0.00	0.9270	0.0730	0.0003
611.42	0.39	0.00	0.9278	0.0722	0.0003
611.41	0.38	0.00	0.9286	0.0714	0.0003
611.40	0.38	0.00	0.9294	0.0706	0.0003
611.39	0.38	0.00	0.9302	0.0698	0.0003
611.38	0.38	0.00	0.9310	0.0690	0.0003
611.37	0.37	0.00	0.9318	0.0682	0.0003
611.36	0.37	0.00	0.9326	0.0674	0.0003
611.35	0.37	0.00	0.9334	0.0666	0.0003
611.34	0.37	0.00	0.9342	0.0658	0.0003



611.33	0.37	0.00	0.9349	0.0651	0.0003
611.32	0.36	0.00	0.9357	0.0643	0.0003
611.31	0.36	0.00	0.9365	0.0635	0.0003
611.30	0.36	0.00	0.9373	0.0627	0.0003
611.29	0.36	0.00	0.9380	0.0620	0.0002
611.28	0.35	0.00	0.9388	0.0612	0.0002
611.27	0.35	0.00	0.9395	0.0605	0.0002
611.26	0.35	0.00	0.9403	0.0597	0.0002
611.25	0.35	0.00	0.9410	0.0590	0.0002
611.24	0.34	0.00	0.9418	0.0582	0.0002
611.23	0.34	0.00	0.9425	0.0575	0.0002
611.22	0.34	0.00	0.9433	0.0567	0.0002
611.21	0.34	0.00	0.9440	0.0560	0.0002
611.20	0.34	0.00	0.9447	0.0553	0.0002
611.19	0.33	0.00	0.9455	0.0545	0.0002
611.18	0.33	0.00	0.9462	0.0538	0.0002
611.17	0.33	0.00	0.9469	0.0531	0.0002
611.16	0.33	0.00	0.9476	0.0524	0.0002
611.15	0.32	0.00	0.9483	0.0517	0.0002
611.14	0.32	0.00	0.9490	0.0510	0.0002
611.13	0.32	0.00	0.9497	0.0503	0.0002
611.12	0.32	0.00	0.9504	0.0496	0.0002
611.11	0.31	0.00	0.9511	0.0489	0.0002
611.10	0.31	0.00	0.9518	0.0482	0.0002
611.09	0.31	0.00	0.9525	0.0475	0.0002
611.08	0.31	0.00	0.9532	0.0468	0.0002
611.07	0.31	0.00	0.9539	0.0461	0.0002
611.06	0.30	0.00	0.9546	0.0454	0.0002
611.05	0.30	0.00	0.9552	0.0448	0.0002
611.04	0.30	0.00	0.9559	0.0441	0.0002
611.03	0.30	0.00	0.9566	0.0434	0.0002
611.02	0.29	0.00	0.9572	0.0428	0.0002
611.01	0.29	0.00	0.9579	0.0421	0.0002
611.00	0.29	0.00	0.9585	0.0415	0.0002
610.99	0.29	0.00	0.9592	0.0408	0.0002
610.98	0.28	0.00	0.9598	0.0402	0.0002
610.97	0.28	0.00	0.9605	0.0395	0.0002
610.96	0.28	0.00	0.9611	0.0389	0.0002
610.95	0.28	0.00	0.9617	0.0383	0.0002
610.94	0.28	0.00	0.9623	0.0377	0.0002
610.93	0.27	0.00	0.9630	0.0370	0.0001
610.92	0.27	0.00	0.9636	0.0364	0.0001
610.91	0.27	0.00	0.9642	0.0358	0.0001
610.90	0.27	0.00	0.9648	0.0352	0.0001
610.89	0.26	0.00	0.9654	0.0346	0.0001
610.88	0.26	0.00	0.9660	0.0340	0.0001
610.87	0.26	0.00	0.9666	0.0334	0.0001
610.86	0.26	0.00	0.9672	0.0328	0.0001
610.85	0.26	0.00	0.9677	0.0323	0.0001
610.84	0.25	0.00	0.9683	0.0317	0.0001
610.83	0.25	0.00	0.9689	0.0311	0.0001
610.82	0.25	0.00	0.9695	0.0305	0.0001
610.81	0.25	0.00	0.9700	0.0300	0.0001
610.80	0.24	0.00	0.9706	0.0294	0.0001
610.79	0.24	0.00	0.9711	0.0289	0.0001
610.78	0.24	0.00	0.9717	0.0283	0.0001
610.77	0.24	0.00	0.9722	0.0278	0.0001
610.76	0.23	0.00	0.9728	0.0272	0.0001
610.75	0.23	0.00	0.9733	0.0267	0.0001
610.74	0.23	0.00	0.9738	0.0262	0.0001
610.73	0.23	0.00	0.9744	0.0256	0.0001
610.72	0.23	0.00	0.9749	0.0251	0.0001
610.71	0.22	0.00	0.9754	0.0246	0.0001
610.70	0.22	0.00	0.9759	0.0241	0.0001
610.69	0.22	0.00	0.9764	0.0236	0.0001
610.68	0.22	0.00	0.9769	0.0231	0.0001
610.67	0.21	0.00	0.9774	0.0226	0.0001
610.66	0.21	0.00	0.9779	0.0221	0.0001
610.65	0.21	0.00	0.9784	0.0216	0.0001
610.64	0.21	0.00	0.9789	0.0211	0.0001
610.63	0.20	0.00	0.9793	0.0207	0.0001
610.62	0.20	0.00	0.9798	0.0202	0.0001
610.61	0.20	0.00	0.9803	0.0197	0.0001
610.60	0.20	0.00	0.9807	0.0193	0.0001
610.59	0.20	0.00	0.9812	0.0188	0.0001
610.58	0.19	0.00	0.9816	0.0184	0.0001
610.57	0.19	0.00	0.9821	0.0179	0.0001
610.56	0.19	0.00	0.9825	0.0175	0.0001
610.55	0.19	0.00	0.9830	0.0170	0.0001

610.54	0.18	0.00	0.9834	0.0166	0.0001
610.53	0.18	0.00	0.9838	0.0162	0.0001
610.52	0.18	0.00	0.9842	0.0158	0.0001
610.51	0.18	0.00	0.9846	0.0154	0.0001
610.50	0.17	0.00	0.9850	0.0150	0.0001
610.49	0.17	0.00	0.9854	0.0146	0.0001
610.48	0.17	0.00	0.9858	0.0142	0.0001
610.47	0.17	0.00	0.9862	0.0138	0.0001
610.46	0.17	0.00	0.9866	0.0134	0.0001
610.45	0.16	0.00	0.9870	0.0130	0.0001
610.44	0.16	0.00	0.9874	0.0126	0.0001
610.43	0.16	0.00	0.9877	0.0123	0.0000
610.42	0.16	0.00	0.9881	0.0119	0.0000
610.41	0.15	0.00	0.9885	0.0115	0.0000
610.40	0.15	0.00	0.9888	0.0112	0.0000
610.39	0.15	0.00	0.9892	0.0108	0.0000
610.38	0.15	0.00	0.9895	0.0105	0.0000
610.37	0.14	0.00	0.9898	0.0102	0.0000
610.36	0.14	0.00	0.9902	0.0098	0.0000
610.35	0.14	0.00	0.9905	0.0095	0.0000
610.34	0.14	0.00	0.9908	0.0092	0.0000
610.33	0.14	0.00	0.9911	0.0089	0.0000
610.32	0.13	0.00	0.9914	0.0086	0.0000
610.31	0.13	0.00	0.9917	0.0083	0.0000
610.30	0.13	0.00	0.9920	0.0080	0.0000
610.29	0.13	0.00	0.9923	0.0077	0.0000
610.28	0.12	0.00	0.9926	0.0074	0.0000
610.27	0.12	0.00	0.9929	0.0071	0.0000
610.26	0.12	0.00	0.9932	0.0068	0.0000
610.25	0.12	0.00	0.9934	0.0066	0.0000
610.24	0.11	0.00	0.9937	0.0063	0.0000
610.23	0.11	0.00	0.9940	0.0060	0.0000
610.22	0.11	0.00	0.9942	0.0058	0.0000
610.21	0.11	0.00	0.9945	0.0055	0.0000
610.20	0.11	0.00	0.9947	0.0053	0.0000
610.19	0.10	0.00	0.9949	0.0051	0.0000
610.18	0.10	0.00	0.9952	0.0048	0.0000
610.17	0.10	0.00	0.9954	0.0046	0.0000
610.16	0.10	0.00	0.9956	0.0044	0.0000
610.15	0.09	0.00	0.9958	0.0042	0.0000
610.14	0.09	0.00	0.9960	0.0040	0.0000
610.13	0.09	0.00	0.9963	0.0037	0.0000
610.12	0.09	0.00	0.9965	0.0035	0.0000
610.11	0.08	0.00	0.9966	0.0034	0.0000
610.10	0.08	0.00	0.9968	0.0032	0.0000
610.09	0.08	0.00	0.9970	0.0030	0.0000
610.08	0.08	0.00	0.9972	0.0028	0.0000
610.07	0.08	0.00	0.9974	0.0026	0.0000
610.06	0.07	0.00	0.9975	0.0025	0.0000
610.05	0.07	0.00	0.9977	0.0023	0.0000
610.04	0.07	0.00	0.9978	0.0022	0.0000
610.03	0.07	0.00	0.9980	0.0020	0.0000
610.02	0.06	0.00	0.9981	0.0019	0.0000
610.01	0.06	0.00	0.9983	0.0017	0.0000
610.00	0.06	0.00	0.9984	0.0016	0.0000
609.99	0.06	0.00	0.9985	0.0015	0.0000
609.98	0.06	0.00	0.9986	0.0014	0.0000
609.97	0.05	0.00	0.9988	0.0012	0.0000
609.96	0.05	0.00	0.9989	0.0011	0.0000
609.95	0.05	0.00	0.9990	0.0010	0.0000
609.94	0.05	0.00	0.9991	0.0009	0.0000
609.93	0.04	0.00	0.9992	0.0008	0.0000
609.92	0.04	0.00	0.9993	0.0007	0.0000
609.91	0.04	0.00	0.9993	0.0007	0.0000
609.90	0.04	0.00	0.9994	0.0006	0.0000
609.89	0.03	0.00	0.9995	0.0005	0.0000
609.88	0.03	0.00	0.9996	0.0004	0.0000
609.87	0.03	0.00	0.9996	0.0004	0.0000
609.86	0.03	0.00	0.9997	0.0003	0.0000
609.85	0.03	0.00	0.9997	0.0003	0.0000
609.84	0.02	0.00	0.9998	0.0002	0.0000
609.83	0.02	0.00	0.9998	0.0002	0.0000
609.82	0.02	0.00	0.9999	0.0001	0.0000
609.81	0.02	0.00	0.9999	0.0001	0.0000
609.80	0.01	0.00	0.9999	0.0001	0.0000
609.79	0.01	0.00	0.9999	0.0001	0.0000
609.78	0.01	0.00	1.0000	0.0000	0.0000
609.77	0.01	0.00	1.0000	0.0000	0.0000
609.76	0.00	0.00	1.0000	0.0000	0.0000



Data Entry Worksheet for Soil Samples -- Oil Specific Volume (OSV) Calculations

Project No. = 406   = User must enter the soil or fluid parameter, or lab data, as appropriate  
 Boring Designation = MW-1

Soil Parameters

Fluid Parameters

Oil Parameters

Required to Estimate OSV - Soil

Required to Estimate OSV - Soil

$\rho_b$  = 1.6 g/cm<sup>3</sup> Bulk density of soil

$\rho_o$  = 0.7903 g/cm<sup>3</sup> Oil density

Soil Sample Data

Sample Intervals (maximum 21 samples)

	Feet (bgs)	to	Feet (bgs)	GRO or DRO (mg/kg)
1	<span style="background-color: #d4edda;"> </span>		<span style="background-color: #d4edda;"> </span>	<span style="background-color: #d4edda;"> </span>
2	<span style="background-color: #d4edda;"> </span>		<span style="background-color: #d4edda;"> </span>	<span style="background-color: #d4edda;"> </span>
3	<span style="background-color: #d4edda;"> </span>		<span style="background-color: #d4edda;"> </span>	<span style="background-color: #d4edda;"> </span>
4	<span style="background-color: #d4edda;"> </span>		<span style="background-color: #d4edda;"> </span>	<span style="background-color: #d4edda;"> </span>
5	<span style="background-color: #d4edda;"> </span>		<span style="background-color: #d4edda;"> </span>	<span style="background-color: #d4edda;"> </span>
6	<span style="background-color: #d4edda;"> </span>		<span style="background-color: #d4edda;"> </span>	<span style="background-color: #d4edda;"> </span>
7	<span style="background-color: #d4edda;"> </span>		<span style="background-color: #d4edda;"> </span>	<span style="background-color: #d4edda;"> </span>
8	<span style="background-color: #d4edda;"> </span>		<span style="background-color: #d4edda;"> </span>	<span style="background-color: #d4edda;"> </span>
9	<span style="background-color: #d4edda;"> </span>		<span style="background-color: #d4edda;"> </span>	<span style="background-color: #d4edda;"> </span>
10	<span style="background-color: #d4edda;"> </span>		<span style="background-color: #d4edda;"> </span>	<span style="background-color: #d4edda;"> </span>
11	<span style="background-color: #d4edda;"> </span>		<span style="background-color: #d4edda;"> </span>	<span style="background-color: #d4edda;"> </span>
12	<span style="background-color: #d4edda;"> </span>		<span style="background-color: #d4edda;"> </span>	<span style="background-color: #d4edda;"> </span>
13	<span style="background-color: #d4edda;"> </span>		<span style="background-color: #d4edda;"> </span>	<span style="background-color: #d4edda;"> </span>
14	<span style="background-color: #d4edda;"> </span>		<span style="background-color: #d4edda;"> </span>	<span style="background-color: #d4edda;"> </span>
15	<span style="background-color: #d4edda;"> </span>		<span style="background-color: #d4edda;"> </span>	<span style="background-color: #d4edda;"> </span>
16	<span style="background-color: #d4edda;"> </span>		<span style="background-color: #d4edda;"> </span>	<span style="background-color: #d4edda;"> </span>
17	<span style="background-color: #d4edda;"> </span>		<span style="background-color: #d4edda;"> </span>	<span style="background-color: #d4edda;"> </span>
18	<span style="background-color: #d4edda;"> </span>		<span style="background-color: #d4edda;"> </span>	<span style="background-color: #d4edda;"> </span>
19	<span style="background-color: #d4edda;"> </span>		<span style="background-color: #d4edda;"> </span>	<span style="background-color: #d4edda;"> </span>
20	<span style="background-color: #d4edda;"> </span>		<span style="background-color: #d4edda;"> </span>	<span style="background-color: #d4edda;"> </span>
21	<span style="background-color: #d4edda;"> </span>		<span style="background-color: #d4edda;"> </span>	<span style="background-color: #d4edda;"> </span>

Deepest sample must be entered in this row

## Data Entry Worksheet for Monitoring Well Fluid Data -- Oil Specific Volume (OSV) Calculations

Project No. = 406  
Boring Designation = MW-1

= User must enter the soil or fluid parameter, or lab data, as appropriate

### Soil Parameters

#### Required to Estimate OSV - MWs

$\phi$  = 0.437 Total porosity

$\sigma_{ow}$  = 18.2 dynes/cm Oil/Water Interfacial Tension

$\sigma_{ao}$  = 22.7 dynes/cm Air/Oil Surface Tension

$\sigma_{aw}$  = 62.1 dynes/cm Air/Water Surface Tension

$\alpha$  = 0.125 /foot Van Genuchten mean pore-size parameter

$n$  = 3.00500 Van Genuchten pore-size distribution exponent

$S_m$  = 0.046 Irreducible water saturation

### Fluid Parameters

$\rho_{ro}$  = 0.7903 Ratio of oil to water density

$\beta_{ao}$  = 2.74 Ratio of water surface tension to oil surface tension

$\beta_{ow}$  = 3.41 Ratio of water surface tension to oil-water interfacial tension

$Z_{ow}$  = 19.71 feet Depth to oil/air interface

$Z_{ao}$  = 20.1 feet Depth to oil/water interface

$S_m$  = 0.046 Water saturation at field capacity

$\alpha$  = 0.125 /foot Van Genuchten mean pore-size parameter

$n$  = 3.00500 Van Genuchten pore-size distribution exponent

$m$  = 0.334443 Calculated from "n" (Burdine)

$dZ$  = 0.01 feet Integration increment (0.01 to 1.0)

TOC = 637.6 feet Elevation of TOC or measuring point



Oil Specific Volume Calculation Spreadsheet for Free-phase Hydrocarbon in Monitoring Wells

Project No. 406  
Boring Designation MW-1

**DO NOT CHANGE ANY CELLS ON THIS WORKSHEET**

Z (feet)	$h_{ow}$ (feet)	$h_{ao}$ (feet)	$S_w$ (--)	$S_{of}$ (--)	$\phi S_{of} dZ$ (ft <sup>3</sup> /ft <sup>2</sup> )
Z <sub>u</sub> = 618.08	0.12	0.15	0.9999	0.0000	0.0000
618.07	0.12	0.14	0.9999	0.0000	0.0000
618.06	0.12	0.14	0.9999	0.0000	0.0000
618.05	0.12	0.13	0.9999	0.0000	0.0000
618.04	0.11	0.12	0.9999	0.0000	0.0000
618.03	0.11	0.11	0.9999	0.0000	0.0000
618.02	0.11	0.11	0.9999	0.0000	0.0000
618.01	0.11	0.10	0.9999	0.0000	0.0000
618.00	0.11	0.09	0.9999	0.0000	0.0000
617.99	0.10	0.08	0.9999	0.0000	0.0000
617.98	0.10	0.07	0.9999	0.0000	0.0000
617.97	0.10	0.07	1.0000	0.0000	0.0000
617.96	0.10	0.06	1.0000	0.0000	0.0000
617.95	0.09	0.05	1.0000	0.0000	0.0000
617.94	0.09	0.04	1.0000	0.0000	0.0000
617.93	0.09	0.03	1.0000	0.0000	0.0000
617.92	0.09	0.03	1.0000	0.0000	0.0000
617.91	0.09	0.02	1.0000	0.0000	0.0000
617.90	0.08	0.01	1.0000	0.0000	0.0000
617.89	0.08	0.00	1.0000	0.0000	0.0000
617.88	0.08	0.00	1.0000	0.0000	0.0000
617.87	0.08	0.00	1.0000	0.0000	0.0000
617.86	0.08	0.00	1.0000	0.0000	0.0000
617.85	0.07	0.00	1.0000	0.0000	0.0000
617.84	0.07	0.00	1.0000	0.0000	0.0000
617.83	0.07	0.00	1.0000	0.0000	0.0000
617.82	0.07	0.00	1.0000	0.0000	0.0000
617.81	0.07	0.00	1.0000	0.0000	0.0000
617.80	0.06	0.00	1.0000	0.0000	0.0000
617.79	0.06	0.00	1.0000	0.0000	0.0000
617.78	0.06	0.00	1.0000	0.0000	0.0000
617.77	0.06	0.00	1.0000	0.0000	0.0000
617.76	0.06	0.00	1.0000	0.0000	0.0000
617.75	0.05	0.00	1.0000	0.0000	0.0000
617.74	0.05	0.00	1.0000	0.0000	0.0000
617.73	0.05	0.00	1.0000	0.0000	0.0000
617.72	0.05	0.00	1.0000	0.0000	0.0000
617.71	0.04	0.00	1.0000	0.0000	0.0000
617.70	0.04	0.00	1.0000	0.0000	0.0000
617.69	0.04	0.00	1.0000	0.0000	0.0000
617.68	0.04	0.00	1.0000	0.0000	0.0000
617.67	0.04	0.00	1.0000	0.0000	0.0000
617.66	0.03	0.00	1.0000	0.0000	0.0000
617.65	0.03	0.00	1.0000	0.0000	0.0000
617.64	0.03	0.00	1.0000	0.0000	0.0000
617.63	0.03	0.00	1.0000	0.0000	0.0000
617.62	0.03	0.00	1.0000	0.0000	0.0000
617.61	0.02	0.00	1.0000	0.0000	0.0000
617.60	0.02	0.00	1.0000	0.0000	0.0000
617.59	0.02	0.00	1.0000	0.0000	0.0000
617.58	0.02	0.00	1.0000	0.0000	0.0000
617.57	0.02	0.00	1.0000	0.0000	0.0000
617.56	0.01	0.00	1.0000	0.0000	0.0000
617.55	0.01	0.00	1.0000	0.0000	0.0000
617.54	0.01	0.00	1.0000	0.0000	0.0000
617.53	0.01	0.00	1.0000	0.0000	0.0000
617.52	0.00	0.00	1.0000	0.0000	0.0000
617.51	0.00	0.00	1.0000	0.0000	0.0000
617.50	0.00	0.00	1.0000	0.0000	0.0000
Z <sub>ow</sub> = 617.50	0.00	0.00	1.0000	0.0000	0.0000
Z <sub>ow</sub> = 617.50	0.00	0.00	1.0000	0.0000	0.0000
Z <sub>ow</sub> = 617.50	0.00	0.00	1.0000	0.0000	0.0000
Z <sub>ow</sub> = 617.50	0.00	0.00	1.0000	0.0000	0.0000
Z <sub>ow</sub> = 617.50	0.00	0.00	1.0000	0.0000	0.0000
Z <sub>ow</sub> = 617.50	0.00	0.00	1.0000	0.0000	0.0000
Z <sub>ow</sub> = 617.50	0.00	0.00	1.0000	0.0000	0.0000
Z <sub>ow</sub> = 617.50	0.00	0.00	1.0000	0.0000	0.0000
Z <sub>ow</sub> = 617.50	0.00	0.00	1.0000	0.0000	0.0000
Z <sub>ow</sub> = 617.50	0.00	0.00	1.0000	0.0000	0.0000

$$Z_u = \rho_{ro} \beta_{ao} H_o / [\rho_{ro} \beta_{ao} - (1 - \rho_{ro}) \beta_{ow}]$$

= 618.08 feet

where:

$\rho_{ro}$  = 0.7903

$\beta_{ao}$  = 2.74

$\beta_{ow}$  = 3.41

$H_o$  = 0.39 feet

$Z_{ow}$  = 617.5 feet

$Z_{ao}$  = 617.89 feet

Other parameters used in calculations (from Data Entry - MWs)

$S_m$  = 0.046

$\alpha$  = 0.125 /foot

$n$  = 3.005

$m$  = 0.334442596

$dZ$  = 0.01 feet      Integration increment (0.01 to 1.0)

$\phi$  = 0.437

Oil Specific Volume

$\Sigma \phi S_{of} dZ$  = 3.7786E-06 ft<sup>3</sup>/ft<sup>2</sup>      Oil Specific Volume











Data Entry Worksheet for Soil Samples -- Oil Specific Volume (OSV) Calculations

Project No. = 406 [ ] = User must enter the soil or fluid parameter, or lab data, as appropriate  
Boring Designation = MW-14

Soil Parameters

Fluid Parameters

Oil Parameters

Required to Estimate OSV - Soil

Required to Estimate OSV - Soil

$\rho_b = 1.5 \text{ g/cm}^3$  Bulk density of soil

$\rho_o = 0.772 \text{ g/cm}^3$  Oil density

Soil Sample Data

Sample Intervals (maximum 21 samples)

	Feet (bgs)	to	Feet (bgs)	GRO or DRO (mg/kg)
1	[ ]		[ ]	[ ]
2	[ ]		[ ]	[ ]
3	[ ]		[ ]	[ ]
4	[ ]		[ ]	[ ]
5	[ ]		[ ]	[ ]
6	[ ]		[ ]	[ ]
7	[ ]		[ ]	[ ]
8	[ ]		[ ]	[ ]
9	[ ]		[ ]	[ ]
10	[ ]		[ ]	[ ]
11	[ ]		[ ]	[ ]
12	[ ]		[ ]	[ ]
13	[ ]		[ ]	[ ]
14	[ ]		[ ]	[ ]
15	[ ]		[ ]	[ ]
16	[ ]		[ ]	[ ]
17	[ ]		[ ]	[ ]
18	[ ]		[ ]	[ ]
19	[ ]		[ ]	[ ]
20	[ ]		[ ]	[ ]
21	[ ]		[ ]	[ ]

Deepest sample must be entered in this row

Data Entry Worksheet for Monitoring Well Fluid Data -- Oil Specific Volume (OSV) Calculations

Project No. = 406  
Boring Designation = MW-14

[ ] = User must enter the soil or fluid parameter, or lab data, as appropriate

Soil Parameters

Required to Estimate OSV - MWs

$\phi$  = 0.437 Total porosity  
 $\sigma_{ow}$  = 24.1 dynes/cm Oil/Water Interfacial Tension  
 $\sigma_{ao}$  = 22.6 dynes/cm Air/Oil Surface Tension  
 $\sigma_{aw}$  = 65.5 dynes/cm Air/Water Surface Tension  
 $\alpha$  = 0.125 /foot Van Genuchten mean pore-size parameter  
 $n$  = 3.00500 Van Genuchten pore-size distribution exponent  
 $S_m$  = 0.046 Irreducible water saturation

Fluid Parameters

$\rho_{ro}$  = 0.772 Ratio of oil to water density  
 $\beta_{ao}$  = 2.90 Ratio of water surface tension to oil surface tension  
 $\beta_{ow}$  = 2.72 Ratio of water surface tension to oil-water interfacial tension  
 $Z_{ow}$  = 20.9 feet Depth to oil/air interface  
 $Z_{ao}$  = 25.14 feet Depth to oil/water interface  
 $S_m$  = 0.046 Water saturation at field capacity  
 $\alpha$  = 0.125 /foot Van Genuchten mean pore-size parameter  
 $n$  = 3.00500 Van Genuchten pore-size distribution exponent  
 $m$  = 0.334443 Calculated from "n" (Burdine)  
 $dZ$  = 0.01 feet Integration increment (0.01 to 1.0)  
TOC = 636.38 feet Elevation of TOC or measuring point



Oil Specific Volume Calculation Spreadsheet for Free-phase Hydrocarbon in Monitoring Wells

Project No. 406  
 Boring Designation MW-14

**DO NOT CHANGE ANY CELLS ON THIS WORKSHEET**

Z (feet)	h <sub>ow</sub> (feet)	h <sub>ao</sub> (feet)	S <sub>w</sub> (--)	S <sub>of</sub> (--)	φ S <sub>of</sub> dZ (ft <sup>3</sup> /ft <sup>2</sup> )
Z <sub>u</sub> = 617.10	1.34	1.25	0.9449	0.0000	0.0000
617.09	1.33	1.25	0.9451	0.0007	0.0000
617.08	1.33	1.24	0.9454	0.0014	0.0000
617.07	1.33	1.23	0.9456	0.0020	0.0000
617.06	1.33	1.22	0.9459	0.0027	0.0000
617.05	1.33	1.22	0.9462	0.0033	0.0000
617.04	1.32	1.21	0.9464	0.0040	0.0000
617.03	1.32	1.20	0.9467	0.0046	0.0000
617.02	1.32	1.19	0.9469	0.0052	0.0000
617.01	1.32	1.18	0.9472	0.0058	0.0000
617.00	1.31	1.18	0.9474	0.0064	0.0000
616.99	1.31	1.17	0.9477	0.0070	0.0000
616.98	1.31	1.16	0.9480	0.0076	0.0000
616.97	1.31	1.15	0.9482	0.0082	0.0000
616.96	1.31	1.15	0.9485	0.0088	0.0000
616.95	1.30	1.14	0.9487	0.0093	0.0000
616.94	1.30	1.13	0.9490	0.0099	0.0000
616.93	1.30	1.12	0.9492	0.0104	0.0000
616.92	1.30	1.11	0.9495	0.0110	0.0000
616.91	1.29	1.11	0.9497	0.0115	0.0001
616.90	1.29	1.10	0.9500	0.0120	0.0001
616.89	1.29	1.09	0.9502	0.0125	0.0001
616.88	1.29	1.08	0.9505	0.0130	0.0001
616.87	1.28	1.08	0.9507	0.0135	0.0001
616.86	1.28	1.07	0.9509	0.0140	0.0001
616.85	1.28	1.06	0.9512	0.0145	0.0001
616.84	1.28	1.05	0.9514	0.0149	0.0001
616.83	1.28	1.05	0.9517	0.0154	0.0001
616.82	1.27	1.04	0.9519	0.0158	0.0001
616.81	1.27	1.03	0.9522	0.0163	0.0001
616.80	1.27	1.02	0.9524	0.0167	0.0001
616.79	1.27	1.01	0.9526	0.0172	0.0001
616.78	1.26	1.01	0.9529	0.0176	0.0001
616.77	1.26	1.00	0.9531	0.0180	0.0001
616.76	1.26	0.99	0.9534	0.0184	0.0001
616.75	1.26	0.98	0.9536	0.0188	0.0001
616.74	1.25	0.98	0.9538	0.0192	0.0001
616.73	1.25	0.97	0.9541	0.0195	0.0001
616.72	1.25	0.96	0.9543	0.0199	0.0001
616.71	1.25	0.95	0.9545	0.0203	0.0001
616.70	1.25	0.94	0.9548	0.0206	0.0001
616.69	1.24	0.94	0.9550	0.0210	0.0001
616.68	1.24	0.93	0.9552	0.0213	0.0001
616.67	1.24	0.92	0.9555	0.0216	0.0001
616.66	1.24	0.91	0.9557	0.0220	0.0001
616.65	1.23	0.91	0.9559	0.0223	0.0001
616.64	1.23	0.90	0.9562	0.0226	0.0001
616.63	1.23	0.89	0.9564	0.0229	0.0001
616.62	1.23	0.88	0.9566	0.0232	0.0001
616.61	1.23	0.88	0.9569	0.0235	0.0001
616.60	1.22	0.87	0.9571	0.0237	0.0001
616.59	1.22	0.86	0.9573	0.0240	0.0001
616.58	1.22	0.85	0.9575	0.0243	0.0001
616.57	1.22	0.84	0.9578	0.0245	0.0001
616.56	1.21	0.84	0.9580	0.0248	0.0001
616.55	1.21	0.83	0.9582	0.0250	0.0001
616.54	1.21	0.82	0.9584	0.0252	0.0001
616.53	1.21	0.81	0.9587	0.0255	0.0001
616.52	1.20	0.81	0.9589	0.0257	0.0001
616.51	1.20	0.80	0.9591	0.0259	0.0001
616.50	1.20	0.79	0.9593	0.0261	0.0001
616.49	1.20	0.78	0.9595	0.0263	0.0001
616.48	1.20	0.78	0.9598	0.0265	0.0001
616.47	1.19	0.77	0.9600	0.0267	0.0001
616.46	1.19	0.76	0.9602	0.0268	0.0001
616.45	1.19	0.75	0.9604	0.0270	0.0001
616.44	1.19	0.74	0.9606	0.0272	0.0001

$$Z_u = \rho_{ro} \beta_{ao} H_o / [\rho_{ro} \beta_{ao} - (1 - \rho_{ro}) \beta_{ow}]$$

= 617.10 feet

where:

ρ<sub>ro</sub> = 0.772

β<sub>ao</sub> = 2.90

β<sub>ow</sub> = 2.72

H<sub>o</sub> = 4.24 feet

Z<sub>ow</sub> = 611.24 feet

Z<sub>ao</sub> = 615.48 feet

Other parameters used in calculations (from Data Entry - MWs)

S<sub>m</sub> = 0.046

α = 0.125 /foot

n = 3.005

m = 0.334442596

dZ = 0.01 feet      Integration increment (0.01 to 1.0)

φ = 0.437

Oil Specific Volume

Σφ S<sub>of</sub> dZ = 2.6333E-02 ft<sup>3</sup>/ft<sup>2</sup>      Oil Specific Volume

616.43	1.18	0.74	0.9608	0.0273	0.0001
616.42	1.18	0.73	0.9611	0.0275	0.0001
616.41	1.18	0.72	0.9613	0.0276	0.0001
616.40	1.18	0.71	0.9615	0.0278	0.0001
616.39	1.18	0.71	0.9617	0.0279	0.0001
616.38	1.17	0.70	0.9619	0.0280	0.0001
616.37	1.17	0.69	0.9621	0.0281	0.0001
616.36	1.17	0.68	0.9623	0.0282	0.0001
616.35	1.17	0.67	0.9625	0.0283	0.0001
616.34	1.16	0.67	0.9628	0.0284	0.0001
616.33	1.16	0.66	0.9630	0.0285	0.0001
616.32	1.16	0.65	0.9632	0.0286	0.0001
616.31	1.16	0.64	0.9634	0.0287	0.0001
616.30	1.15	0.64	0.9636	0.0288	0.0001
616.29	1.15	0.63	0.9638	0.0288	0.0001
616.28	1.15	0.62	0.9640	0.0289	0.0001
616.27	1.15	0.61	0.9642	0.0289	0.0001
616.26	1.15	0.61	0.9644	0.0290	0.0001
616.25	1.14	0.60	0.9646	0.0290	0.0001
616.24	1.14	0.59	0.9648	0.0291	0.0001
616.23	1.14	0.58	0.9650	0.0291	0.0001
616.22	1.14	0.57	0.9652	0.0291	0.0001
616.21	1.13	0.57	0.9654	0.0292	0.0001
616.20	1.13	0.56	0.9656	0.0292	0.0001
616.19	1.13	0.55	0.9658	0.0292	0.0001
616.18	1.13	0.54	0.9660	0.0292	0.0001
616.17	1.12	0.54	0.9662	0.0292	0.0001
616.16	1.12	0.53	0.9664	0.0292	0.0001
616.15	1.12	0.52	0.9666	0.0292	0.0001
616.14	1.12	0.51	0.9668	0.0292	0.0001
616.13	1.12	0.50	0.9670	0.0292	0.0001
616.12	1.11	0.50	0.9672	0.0292	0.0001
616.11	1.11	0.49	0.9674	0.0291	0.0001
616.10	1.11	0.48	0.9676	0.0291	0.0001
616.09	1.11	0.47	0.9677	0.0291	0.0001
616.08	1.10	0.47	0.9679	0.0290	0.0001
616.07	1.10	0.46	0.9681	0.0290	0.0001
616.06	1.10	0.45	0.9683	0.0289	0.0001
616.05	1.10	0.44	0.9685	0.0289	0.0001
616.04	1.10	0.44	0.9687	0.0288	0.0001
616.03	1.09	0.43	0.9689	0.0288	0.0001
616.02	1.09	0.42	0.9691	0.0287	0.0001
616.01	1.09	0.41	0.9693	0.0286	0.0001
616.00	1.09	0.40	0.9694	0.0286	0.0001
615.99	1.08	0.40	0.9696	0.0285	0.0001
615.98	1.08	0.39	0.9698	0.0284	0.0001
615.97	1.08	0.38	0.9700	0.0283	0.0001
615.96	1.08	0.37	0.9702	0.0283	0.0001
615.95	1.07	0.37	0.9704	0.0282	0.0001
615.94	1.07	0.36	0.9705	0.0281	0.0001
615.93	1.07	0.35	0.9707	0.0280	0.0001
615.92	1.07	0.34	0.9709	0.0279	0.0001
615.91	1.07	0.34	0.9711	0.0278	0.0001
615.90	1.06	0.33	0.9713	0.0277	0.0001
615.89	1.06	0.32	0.9714	0.0276	0.0001
615.88	1.06	0.31	0.9716	0.0275	0.0001
615.87	1.06	0.30	0.9718	0.0274	0.0001
615.86	1.05	0.30	0.9720	0.0273	0.0001
615.85	1.05	0.29	0.9721	0.0271	0.0001
615.84	1.05	0.28	0.9723	0.0270	0.0001
615.83	1.05	0.27	0.9725	0.0269	0.0001
615.82	1.05	0.27	0.9727	0.0268	0.0001
615.81	1.04	0.26	0.9728	0.0267	0.0001
615.80	1.04	0.25	0.9730	0.0265	0.0001
615.79	1.04	0.24	0.9732	0.0264	0.0001
615.78	1.04	0.23	0.9733	0.0263	0.0001
615.77	1.03	0.23	0.9735	0.0261	0.0001
615.76	1.03	0.22	0.9737	0.0260	0.0001
615.75	1.03	0.21	0.9739	0.0259	0.0001
615.74	1.03	0.20	0.9740	0.0257	0.0001
615.73	1.02	0.20	0.9742	0.0256	0.0001
615.72	1.02	0.19	0.9744	0.0254	0.0001
615.71	1.02	0.18	0.9745	0.0253	0.0001
615.70	1.02	0.17	0.9747	0.0252	0.0001
615.69	1.02	0.17	0.9749	0.0250	0.0001
615.68	1.01	0.16	0.9750	0.0249	0.0001
615.67	1.01	0.15	0.9752	0.0247	0.0001
615.66	1.01	0.14	0.9753	0.0246	0.0001
615.65	1.01	0.13	0.9755	0.0244	0.0001



615.64	1.00	0.13	0.9757	0.0243	0.0001
615.63	1.00	0.12	0.9758	0.0241	0.0001
615.62	1.00	0.11	0.9760	0.0240	0.0001
615.61	1.00	0.10	0.9761	0.0238	0.0001
615.60	1.00	0.10	0.9763	0.0237	0.0001
615.59	0.99	0.09	0.9765	0.0235	0.0001
615.58	0.99	0.08	0.9766	0.0234	0.0001
615.57	0.99	0.07	0.9768	0.0232	0.0001
615.56	0.99	0.06	0.9769	0.0231	0.0001
615.55	0.98	0.06	0.9771	0.0229	0.0001
615.54	0.98	0.05	0.9772	0.0228	0.0001
615.53	0.98	0.04	0.9774	0.0226	0.0001
615.52	0.98	0.03	0.9775	0.0225	0.0001
615.51	0.97	0.03	0.9777	0.0223	0.0001
615.50	0.97	0.02	0.9779	0.0221	0.0001
615.49	0.97	0.01	0.9780	0.0220	0.0001
615.48	0.97	0.00	0.9782	0.0218	0.0001
615.47	0.97	0.00	0.9783	0.0217	0.0001
615.46	0.96	0.00	0.9785	0.0215	0.0001
615.45	0.96	0.00	0.9786	0.0214	0.0001
615.44	0.96	0.00	0.9787	0.0213	0.0001
615.43	0.96	0.00	0.9789	0.0211	0.0001
615.42	0.95	0.00	0.9790	0.0210	0.0001
615.41	0.95	0.00	0.9792	0.0208	0.0001
615.40	0.95	0.00	0.9793	0.0207	0.0001
615.39	0.95	0.00	0.9795	0.0205	0.0001
615.38	0.94	0.00	0.9796	0.0204	0.0001
615.37	0.94	0.00	0.9798	0.0202	0.0001
615.36	0.94	0.00	0.9799	0.0201	0.0001
615.35	0.94	0.00	0.9801	0.0199	0.0001
615.34	0.94	0.00	0.9802	0.0198	0.0001
615.33	0.93	0.00	0.9803	0.0197	0.0001
615.32	0.93	0.00	0.9805	0.0195	0.0001
615.31	0.93	0.00	0.9806	0.0194	0.0001
615.30	0.93	0.00	0.9808	0.0192	0.0001
615.29	0.92	0.00	0.9809	0.0191	0.0001
615.28	0.92	0.00	0.9810	0.0190	0.0001
615.27	0.92	0.00	0.9812	0.0188	0.0001
615.26	0.92	0.00	0.9813	0.0187	0.0001
615.25	0.92	0.00	0.9814	0.0186	0.0001
615.24	0.91	0.00	0.9816	0.0184	0.0001
615.23	0.91	0.00	0.9817	0.0183	0.0001
615.22	0.91	0.00	0.9818	0.0182	0.0001
615.21	0.91	0.00	0.9820	0.0180	0.0001
615.20	0.90	0.00	0.9821	0.0179	0.0001
615.19	0.90	0.00	0.9822	0.0178	0.0001
615.18	0.90	0.00	0.9824	0.0176	0.0001
615.17	0.90	0.00	0.9825	0.0175	0.0001
615.16	0.89	0.00	0.9826	0.0174	0.0001
615.15	0.89	0.00	0.9828	0.0172	0.0001
615.14	0.89	0.00	0.9829	0.0171	0.0001
615.13	0.89	0.00	0.9830	0.0170	0.0001
615.12	0.89	0.00	0.9831	0.0169	0.0001
615.11	0.88	0.00	0.9833	0.0167	0.0001
615.10	0.88	0.00	0.9834	0.0166	0.0001
615.09	0.88	0.00	0.9835	0.0165	0.0001
615.08	0.88	0.00	0.9837	0.0163	0.0001
615.07	0.87	0.00	0.9838	0.0162	0.0001
615.06	0.87	0.00	0.9839	0.0161	0.0001
615.05	0.87	0.00	0.9840	0.0160	0.0001
615.04	0.87	0.00	0.9842	0.0158	0.0001
615.03	0.87	0.00	0.9843	0.0157	0.0001
615.02	0.86	0.00	0.9844	0.0156	0.0001
615.01	0.86	0.00	0.9845	0.0155	0.0001
615.00	0.86	0.00	0.9846	0.0154	0.0001
614.99	0.86	0.00	0.9848	0.0152	0.0001
614.98	0.85	0.00	0.9849	0.0151	0.0001
614.97	0.85	0.00	0.9850	0.0150	0.0001
614.96	0.85	0.00	0.9851	0.0149	0.0001
614.95	0.85	0.00	0.9852	0.0148	0.0001
614.94	0.84	0.00	0.9853	0.0147	0.0001
614.93	0.84	0.00	0.9855	0.0145	0.0001
614.92	0.84	0.00	0.9856	0.0144	0.0001
614.91	0.84	0.00	0.9857	0.0143	0.0001
614.90	0.84	0.00	0.9858	0.0142	0.0001
614.89	0.83	0.00	0.9859	0.0141	0.0001
614.88	0.83	0.00	0.9860	0.0140	0.0001
614.87	0.83	0.00	0.9861	0.0139	0.0001
614.86	0.83	0.00	0.9863	0.0137	0.0001

614.85	0.82	0.00	0.9864	0.0136	0.0001
614.84	0.82	0.00	0.9865	0.0135	0.0001
614.83	0.82	0.00	0.9866	0.0134	0.0001
614.82	0.82	0.00	0.9867	0.0133	0.0001
614.81	0.81	0.00	0.9868	0.0132	0.0001
614.80	0.81	0.00	0.9869	0.0131	0.0001
614.79	0.81	0.00	0.9870	0.0130	0.0001
614.78	0.81	0.00	0.9871	0.0129	0.0001
614.77	0.81	0.00	0.9872	0.0128	0.0001
614.76	0.80	0.00	0.9873	0.0127	0.0001
614.75	0.80	0.00	0.9875	0.0125	0.0001
614.74	0.80	0.00	0.9876	0.0124	0.0001
614.73	0.80	0.00	0.9877	0.0123	0.0001
614.72	0.79	0.00	0.9878	0.0122	0.0001
614.71	0.79	0.00	0.9879	0.0121	0.0001
614.70	0.79	0.00	0.9880	0.0120	0.0001
614.69	0.79	0.00	0.9881	0.0119	0.0001
614.68	0.79	0.00	0.9882	0.0118	0.0001
614.67	0.78	0.00	0.9883	0.0117	0.0001
614.66	0.78	0.00	0.9884	0.0116	0.0001
614.65	0.78	0.00	0.9885	0.0115	0.0001
614.64	0.78	0.00	0.9886	0.0114	0.0000
614.63	0.77	0.00	0.9887	0.0113	0.0000
614.62	0.77	0.00	0.9888	0.0112	0.0000
614.61	0.77	0.00	0.9889	0.0111	0.0000
614.60	0.77	0.00	0.9890	0.0110	0.0000
614.59	0.76	0.00	0.9891	0.0109	0.0000
614.58	0.76	0.00	0.9892	0.0108	0.0000
614.57	0.76	0.00	0.9893	0.0107	0.0000
614.56	0.76	0.00	0.9894	0.0106	0.0000
614.55	0.76	0.00	0.9895	0.0105	0.0000
614.54	0.75	0.00	0.9895	0.0105	0.0000
614.53	0.75	0.00	0.9896	0.0104	0.0000
614.52	0.75	0.00	0.9897	0.0103	0.0000
614.51	0.75	0.00	0.9898	0.0102	0.0000
614.50	0.74	0.00	0.9899	0.0101	0.0000
614.49	0.74	0.00	0.9900	0.0100	0.0000
614.48	0.74	0.00	0.9901	0.0099	0.0000
614.47	0.74	0.00	0.9902	0.0098	0.0000
614.46	0.74	0.00	0.9903	0.0097	0.0000
614.45	0.73	0.00	0.9904	0.0096	0.0000
614.44	0.73	0.00	0.9905	0.0095	0.0000
614.43	0.73	0.00	0.9905	0.0095	0.0000
614.42	0.73	0.00	0.9906	0.0094	0.0000
614.41	0.72	0.00	0.9907	0.0093	0.0000
614.40	0.72	0.00	0.9908	0.0092	0.0000
614.39	0.72	0.00	0.9909	0.0091	0.0000
614.38	0.72	0.00	0.9910	0.0090	0.0000
614.37	0.71	0.00	0.9911	0.0089	0.0000
614.36	0.71	0.00	0.9911	0.0089	0.0000
614.35	0.71	0.00	0.9912	0.0088	0.0000
614.34	0.71	0.00	0.9913	0.0087	0.0000
614.33	0.71	0.00	0.9914	0.0086	0.0000
614.32	0.70	0.00	0.9915	0.0085	0.0000
614.31	0.70	0.00	0.9916	0.0084	0.0000
614.30	0.70	0.00	0.9916	0.0084	0.0000
614.29	0.70	0.00	0.9917	0.0083	0.0000
614.28	0.69	0.00	0.9918	0.0082	0.0000
614.27	0.69	0.00	0.9919	0.0081	0.0000
614.26	0.69	0.00	0.9920	0.0080	0.0000
614.25	0.69	0.00	0.9920	0.0080	0.0000
614.24	0.68	0.00	0.9921	0.0079	0.0000
614.23	0.68	0.00	0.9922	0.0078	0.0000
614.22	0.68	0.00	0.9923	0.0077	0.0000
614.21	0.68	0.00	0.9924	0.0076	0.0000
614.20	0.68	0.00	0.9924	0.0076	0.0000
614.19	0.67	0.00	0.9925	0.0075	0.0000
614.18	0.67	0.00	0.9926	0.0074	0.0000
614.17	0.67	0.00	0.9927	0.0073	0.0000
614.16	0.67	0.00	0.9927	0.0073	0.0000
614.15	0.66	0.00	0.9928	0.0072	0.0000
614.14	0.66	0.00	0.9929	0.0071	0.0000
614.13	0.66	0.00	0.9929	0.0071	0.0000
614.12	0.66	0.00	0.9930	0.0070	0.0000
614.11	0.66	0.00	0.9931	0.0069	0.0000
614.10	0.65	0.00	0.9932	0.0068	0.0000
614.09	0.65	0.00	0.9932	0.0068	0.0000
614.08	0.65	0.00	0.9933	0.0067	0.0000
614.07	0.65	0.00	0.9934	0.0066	0.0000

614.06	0.64	0.00	0.9934	0.0066	0.0000
614.05	0.64	0.00	0.9935	0.0065	0.0000
614.04	0.64	0.00	0.9936	0.0064	0.0000
614.03	0.64	0.00	0.9936	0.0064	0.0000
614.02	0.63	0.00	0.9937	0.0063	0.0000
614.01	0.63	0.00	0.9938	0.0062	0.0000
614.00	0.63	0.00	0.9939	0.0061	0.0000
613.99	0.63	0.00	0.9939	0.0061	0.0000
613.98	0.63	0.00	0.9940	0.0060	0.0000
613.97	0.62	0.00	0.9940	0.0060	0.0000
613.96	0.62	0.00	0.9941	0.0059	0.0000
613.95	0.62	0.00	0.9942	0.0058	0.0000
613.94	0.62	0.00	0.9942	0.0058	0.0000
613.93	0.61	0.00	0.9943	0.0057	0.0000
613.92	0.61	0.00	0.9944	0.0056	0.0000
613.91	0.61	0.00	0.9944	0.0056	0.0000
613.90	0.61	0.00	0.9945	0.0055	0.0000
613.89	0.61	0.00	0.9946	0.0054	0.0000
613.88	0.60	0.00	0.9946	0.0054	0.0000
613.87	0.60	0.00	0.9947	0.0053	0.0000
613.86	0.60	0.00	0.9947	0.0053	0.0000
613.85	0.60	0.00	0.9948	0.0052	0.0000
613.84	0.59	0.00	0.9949	0.0051	0.0000
613.83	0.59	0.00	0.9949	0.0051	0.0000
613.82	0.59	0.00	0.9950	0.0050	0.0000
613.81	0.59	0.00	0.9950	0.0050	0.0000
613.80	0.58	0.00	0.9951	0.0049	0.0000
613.79	0.58	0.00	0.9951	0.0049	0.0000
613.78	0.58	0.00	0.9952	0.0048	0.0000
613.77	0.58	0.00	0.9953	0.0047	0.0000
613.76	0.58	0.00	0.9953	0.0047	0.0000
613.75	0.57	0.00	0.9954	0.0046	0.0000
613.74	0.57	0.00	0.9954	0.0046	0.0000
613.73	0.57	0.00	0.9955	0.0045	0.0000
613.72	0.57	0.00	0.9955	0.0045	0.0000
613.71	0.56	0.00	0.9956	0.0044	0.0000
613.70	0.56	0.00	0.9956	0.0044	0.0000
613.69	0.56	0.00	0.9957	0.0043	0.0000
613.68	0.56	0.00	0.9957	0.0043	0.0000
613.67	0.55	0.00	0.9958	0.0042	0.0000
613.66	0.55	0.00	0.9958	0.0042	0.0000
613.65	0.55	0.00	0.9959	0.0041	0.0000
613.64	0.55	0.00	0.9959	0.0041	0.0000
613.63	0.55	0.00	0.9960	0.0040	0.0000
613.62	0.54	0.00	0.9960	0.0040	0.0000
613.61	0.54	0.00	0.9961	0.0039	0.0000
613.60	0.54	0.00	0.9961	0.0039	0.0000
613.59	0.54	0.00	0.9962	0.0038	0.0000
613.58	0.53	0.00	0.9962	0.0038	0.0000
613.57	0.53	0.00	0.9963	0.0037	0.0000
613.56	0.53	0.00	0.9963	0.0037	0.0000
613.55	0.53	0.00	0.9964	0.0036	0.0000
613.54	0.53	0.00	0.9964	0.0036	0.0000
613.53	0.52	0.00	0.9965	0.0035	0.0000
613.52	0.52	0.00	0.9965	0.0035	0.0000
613.51	0.52	0.00	0.9966	0.0034	0.0000
613.50	0.52	0.00	0.9966	0.0034	0.0000
613.49	0.51	0.00	0.9967	0.0033	0.0000
613.48	0.51	0.00	0.9967	0.0033	0.0000
613.47	0.51	0.00	0.9967	0.0033	0.0000
613.46	0.51	0.00	0.9968	0.0032	0.0000
613.45	0.50	0.00	0.9968	0.0032	0.0000
613.44	0.50	0.00	0.9969	0.0031	0.0000
613.43	0.50	0.00	0.9969	0.0031	0.0000
613.42	0.50	0.00	0.9970	0.0030	0.0000
613.41	0.50	0.00	0.9970	0.0030	0.0000
613.40	0.49	0.00	0.9970	0.0030	0.0000
613.39	0.49	0.00	0.9971	0.0029	0.0000
613.38	0.49	0.00	0.9971	0.0029	0.0000
613.37	0.49	0.00	0.9972	0.0028	0.0000
613.36	0.48	0.00	0.9972	0.0028	0.0000
613.35	0.48	0.00	0.9972	0.0028	0.0000
613.34	0.48	0.00	0.9973	0.0027	0.0000
613.33	0.48	0.00	0.9973	0.0027	0.0000
613.32	0.48	0.00	0.9974	0.0026	0.0000
613.31	0.47	0.00	0.9974	0.0026	0.0000
613.30	0.47	0.00	0.9974	0.0026	0.0000
613.29	0.47	0.00	0.9975	0.0025	0.0000
613.28	0.47	0.00	0.9975	0.0025	0.0000





611.69	0.10	0.00	1.0000	0.0000	0.0000
611.68	0.10	0.00	1.0000	0.0000	0.0000
611.67	0.10	0.00	1.0000	0.0000	0.0000
611.66	0.10	0.00	1.0000	0.0000	0.0000
611.65	0.09	0.00	1.0000	0.0000	0.0000
611.64	0.09	0.00	1.0000	0.0000	0.0000
611.63	0.09	0.00	1.0000	0.0000	0.0000
611.62	0.09	0.00	1.0000	0.0000	0.0000
611.61	0.09	0.00	1.0000	0.0000	0.0000
611.60	0.08	0.00	1.0000	0.0000	0.0000
611.59	0.08	0.00	1.0000	0.0000	0.0000
611.58	0.08	0.00	1.0000	0.0000	0.0000
611.57	0.08	0.00	1.0000	0.0000	0.0000
611.56	0.07	0.00	1.0000	0.0000	0.0000
611.55	0.07	0.00	1.0000	0.0000	0.0000
611.54	0.07	0.00	1.0000	0.0000	0.0000
611.53	0.07	0.00	1.0000	0.0000	0.0000
611.52	0.06	0.00	1.0000	0.0000	0.0000
611.51	0.06	0.00	1.0000	0.0000	0.0000
611.50	0.06	0.00	1.0000	0.0000	0.0000
611.49	0.06	0.00	1.0000	0.0000	0.0000
611.48	0.06	0.00	1.0000	0.0000	0.0000
611.47	0.05	0.00	1.0000	0.0000	0.0000
611.46	0.05	0.00	1.0000	0.0000	0.0000
611.45	0.05	0.00	1.0000	0.0000	0.0000
611.44	0.05	0.00	1.0000	0.0000	0.0000
611.43	0.04	0.00	1.0000	0.0000	0.0000
611.42	0.04	0.00	1.0000	0.0000	0.0000
611.41	0.04	0.00	1.0000	0.0000	0.0000
611.40	0.04	0.00	1.0000	0.0000	0.0000
611.39	0.04	0.00	1.0000	0.0000	0.0000
611.38	0.03	0.00	1.0000	0.0000	0.0000
611.37	0.03	0.00	1.0000	0.0000	0.0000
611.36	0.03	0.00	1.0000	0.0000	0.0000
611.35	0.03	0.00	1.0000	0.0000	0.0000
611.34	0.02	0.00	1.0000	0.0000	0.0000
611.33	0.02	0.00	1.0000	0.0000	0.0000
611.32	0.02	0.00	1.0000	0.0000	0.0000
611.31	0.02	0.00	1.0000	0.0000	0.0000
611.30	0.01	0.00	1.0000	0.0000	0.0000
611.29	0.01	0.00	1.0000	0.0000	0.0000
611.28	0.01	0.00	1.0000	0.0000	0.0000
611.27	0.01	0.00	1.0000	0.0000	0.0000
611.26	0.01	0.00	1.0000	0.0000	0.0000
611.25	0.00	0.00	1.0000	0.0000	0.0000
611.24	0.00	0.00	1.0000	0.0000	0.0000
Zow = 611.24	0.00	0.00	1.0000	0.0000	0.0000

Oil Specific Volume      0.0263    ft<sup>3</sup>/ft<sup>2</sup>

Data Entry Worksheet for Soil Samples -- Oil Specific Volume (OSV) Calculations

Project No. = 406   = User must enter the soil or fluid parameter, or lab data, as appropriate  
 Boring Designation = MW-16

Soil Parameters

Fluid Parameters

Oil Parameters

Required to Estimate OSV - Soil

Required to Estimate OSV - Soil

$\rho_b = 1.5 \text{ g/cm}^3$  Bulk density of soil

$\rho_o = 0.772 \text{ g/cm}^3$  Oil density

Soil Sample Data

Sample Intervals (maximum 21 samples)

	Feet (bgs)	to	Feet (bgs)	GRO or DRO (mg/kg)
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				

Deepest sample must be entered in this row

## Data Entry Worksheet for Monitoring Well Fluid Data -- Oil Specific Volume (OSV) Calculations

Project No. = 406  
Boring Designation = MW-16

= User must enter the soil or fluid parameter, or lab data, as appropriate

### Soil Parameters

#### Required to Estimate OSV - MWs

$\phi$  = 0.437 Total porosity

$\sigma_{ow}$  = 24.1 dynes/cm Oil/Water Interfacial Tension

$\sigma_{ao}$  = 22.6 dynes/cm Air/Oil Surface Tension

$\sigma_{aw}$  = 65.5 dynes/cm Air/Water Surface Tension

$\alpha$  = 0.733 /foot Van Genuchten mean pore-size parameter

$n$  = 3.17678 Van Genuchten pore-size distribution exponent

$S_m$  = 0.10414 Irreducible water saturation

### Fluid Parameters

$\rho_{ro}$  = 0.772 Ratio of oil to water density

$\beta_{ao}$  = 2.90 Ratio of water surface tension to oil surface tension

$\beta_{ow}$  = 2.72 Ratio of water surface tension to oil-water interfacial tension

$Z_{ow}$  = 21.71 feet Depth to oil/air interface

$Z_{ao}$  = 31.25 feet Depth to oil/water interface

$S_m$  = 0.10414 Water saturation at field capacity

$\alpha$  = 0.733 /foot Van Genuchten mean pore-size parameter

$n$  = 3.17678 Van Genuchten pore-size distribution exponent

$m$  = 0.370432 Calculated from "n" (Burdine)

$dZ$  = 0.01 feet Integration increment (0.01 to 1.0)

TOC = 637.46 feet Elevation of TOC or measuring point





Oil Specific Volume Calculation Spreadsheet for Free-phase Hydrocarbon in Monitoring Wells

Project No. 406  
Boring Designation MW-16

**DO NOT CHANGE ANY CELLS ON THIS WORKSHEET**

Z (feet)	h <sub>ow</sub> (feet)	h <sub>ao</sub> (feet)	S <sub>w</sub> (--)	S <sub>of</sub> (--)	φ S <sub>of</sub> dZ (ft <sup>3</sup> /ft <sup>2</sup> )
Z <sub>u</sub> = 619.40	3.01	2.82	0.1223	0.0000	0.0000
619.39	3.01	2.81	0.1223	0.0001	0.0000
619.38	3.00	2.81	0.1223	0.0002	0.0000
619.37	3.00	2.80	0.1224	0.0002	0.0000
619.36	3.00	2.79	0.1224	0.0003	0.0000
619.35	3.00	2.78	0.1224	0.0004	0.0000
619.34	2.99	2.77	0.1225	0.0005	0.0000
619.33	2.99	2.77	0.1225	0.0006	0.0000
619.32	2.99	2.76	0.1225	0.0007	0.0000
619.31	2.99	2.75	0.1225	0.0007	0.0000
619.30	2.99	2.74	0.1226	0.0008	0.0000
619.29	2.98	2.74	0.1226	0.0009	0.0000
619.28	2.98	2.73	0.1226	0.0010	0.0000
619.27	2.98	2.72	0.1227	0.0011	0.0000
619.26	2.98	2.71	0.1227	0.0012	0.0000
619.25	2.97	2.71	0.1227	0.0013	0.0000
619.24	2.97	2.70	0.1228	0.0014	0.0000
619.23	2.97	2.69	0.1228	0.0015	0.0000
619.22	2.97	2.68	0.1228	0.0016	0.0000
619.21	2.96	2.67	0.1229	0.0016	0.0000
619.20	2.96	2.67	0.1229	0.0017	0.0000
619.19	2.96	2.66	0.1229	0.0018	0.0000
619.18	2.96	2.65	0.1229	0.0019	0.0000
619.17	2.96	2.64	0.1230	0.0020	0.0000
619.16	2.95	2.64	0.1230	0.0021	0.0000
619.15	2.95	2.63	0.1230	0.0022	0.0000
619.14	2.95	2.62	0.1231	0.0023	0.0000
619.13	2.95	2.61	0.1231	0.0025	0.0000
619.12	2.94	2.60	0.1231	0.0026	0.0000
619.11	2.94	2.60	0.1232	0.0027	0.0000
619.10	2.94	2.59	0.1232	0.0028	0.0000
619.09	2.94	2.58	0.1232	0.0029	0.0000
619.08	2.94	2.57	0.1233	0.0030	0.0000
619.07	2.93	2.57	0.1233	0.0031	0.0000
619.06	2.93	2.56	0.1233	0.0032	0.0000
619.05	2.93	2.55	0.1234	0.0033	0.0000
619.04	2.93	2.54	0.1234	0.0035	0.0000
619.03	2.92	2.54	0.1234	0.0036	0.0000
619.02	2.92	2.53	0.1235	0.0037	0.0000
619.01	2.92	2.52	0.1235	0.0038	0.0000
619.00	2.92	2.51	0.1235	0.0039	0.0000
618.99	2.91	2.50	0.1236	0.0041	0.0000
618.98	2.91	2.50	0.1236	0.0042	0.0000
618.97	2.91	2.49	0.1236	0.0043	0.0000
618.96	2.91	2.48	0.1237	0.0044	0.0000
618.95	2.91	2.47	0.1237	0.0046	0.0000
618.94	2.90	2.47	0.1237	0.0047	0.0000
618.93	2.90	2.46	0.1238	0.0048	0.0000
618.92	2.90	2.45	0.1238	0.0050	0.0000
618.91	2.90	2.44	0.1238	0.0051	0.0000
618.90	2.89	2.44	0.1239	0.0052	0.0000
618.89	2.89	2.43	0.1239	0.0054	0.0000
618.88	2.89	2.42	0.1239	0.0055	0.0000
618.87	2.89	2.41	0.1240	0.0056	0.0000
618.86	2.89	2.40	0.1240	0.0058	0.0000
618.85	2.88	2.40	0.1240	0.0059	0.0000
618.84	2.88	2.39	0.1241	0.0061	0.0000
618.83	2.88	2.38	0.1241	0.0062	0.0000
618.82	2.88	2.37	0.1241	0.0064	0.0000
618.81	2.87	2.37	0.1242	0.0065	0.0000
618.80	2.87	2.36	0.1242	0.0067	0.0000
618.79	2.87	2.35	0.1242	0.0068	0.0000
618.78	2.87	2.34	0.1243	0.0070	0.0000
618.77	2.86	2.33	0.1243	0.0072	0.0000
618.76	2.86	2.33	0.1243	0.0073	0.0000
618.75	2.86	2.32	0.1244	0.0075	0.0000
618.74	2.86	2.31	0.1244	0.0077	0.0000

$$Z_u = \rho_{ro} \beta_{ao} H_o / [\rho_{ro} \beta_{ao} - (1 - \rho_{ro}) \beta_{ow}]$$

= 619.40 feet

where:

ρ<sub>ro</sub> = 0.772

β<sub>ao</sub> = 2.90

β<sub>ow</sub> = 2.72

H<sub>o</sub> = 9.54 feet

Z<sub>ow</sub> = 606.21 feet

Z<sub>ao</sub> = 615.75 feet

Other parameters used in calculations (from Data Entry - MWs)

S<sub>m</sub> = 0.10414

α = 0.733 /foot

n = 3.17678

m = 0.370431695

dZ = 0.01 feet      Integration increment (0.01 to 1.0)

φ = 0.437

Oil Specific Volume

Σφ S<sub>of</sub> dZ = 2.7860E+00 ft<sup>3</sup>/ft<sup>2</sup>      Oil Specific Volume

618.73	2.86	2.30	0.1244	0.0078	0.0000
618.72	2.85	2.30	0.1245	0.0080	0.0000
618.71	2.85	2.29	0.1245	0.0082	0.0000
618.70	2.85	2.28	0.1245	0.0083	0.0000
618.69	2.85	2.27	0.1246	0.0085	0.0000
618.68	2.84	2.27	0.1246	0.0087	0.0000
618.67	2.84	2.26	0.1247	0.0089	0.0000
618.66	2.84	2.25	0.1247	0.0091	0.0000
618.65	2.84	2.24	0.1247	0.0092	0.0000
618.64	2.83	2.23	0.1248	0.0094	0.0000
618.63	2.83	2.23	0.1248	0.0096	0.0000
618.62	2.83	2.22	0.1248	0.0098	0.0000
618.61	2.83	2.21	0.1249	0.0100	0.0000
618.60	2.83	2.20	0.1249	0.0102	0.0000
618.59	2.82	2.20	0.1249	0.0104	0.0000
618.58	2.82	2.19	0.1250	0.0106	0.0000
618.57	2.82	2.18	0.1250	0.0108	0.0000
618.56	2.82	2.17	0.1251	0.0110	0.0000
618.55	2.81	2.16	0.1251	0.0112	0.0000
618.54	2.81	2.16	0.1251	0.0114	0.0000
618.53	2.81	2.15	0.1252	0.0116	0.0001
618.52	2.81	2.14	0.1252	0.0119	0.0001
618.51	2.81	2.13	0.1252	0.0121	0.0001
618.50	2.80	2.13	0.1253	0.0123	0.0001
618.49	2.80	2.12	0.1253	0.0125	0.0001
618.48	2.80	2.11	0.1253	0.0128	0.0001
618.47	2.80	2.10	0.1254	0.0130	0.0001
618.46	2.79	2.10	0.1254	0.0132	0.0001
618.45	2.79	2.09	0.1255	0.0135	0.0001
618.44	2.79	2.08	0.1255	0.0137	0.0001
618.43	2.79	2.07	0.1255	0.0140	0.0001
618.42	2.78	2.06	0.1256	0.0142	0.0001
618.41	2.78	2.06	0.1256	0.0145	0.0001
618.40	2.78	2.05	0.1257	0.0147	0.0001
618.39	2.78	2.04	0.1257	0.0150	0.0001
618.38	2.78	2.03	0.1257	0.0152	0.0001
618.37	2.77	2.03	0.1258	0.0155	0.0001
618.36	2.77	2.02	0.1258	0.0158	0.0001
618.35	2.77	2.01	0.1258	0.0160	0.0001
618.34	2.77	2.00	0.1259	0.0163	0.0001
618.33	2.76	1.99	0.1259	0.0166	0.0001
618.32	2.76	1.99	0.1260	0.0169	0.0001
618.31	2.76	1.98	0.1260	0.0172	0.0001
618.30	2.76	1.97	0.1260	0.0174	0.0001
618.29	2.76	1.96	0.1261	0.0177	0.0001
618.28	2.75	1.96	0.1261	0.0180	0.0001
618.27	2.75	1.95	0.1262	0.0183	0.0001
618.26	2.75	1.94	0.1262	0.0187	0.0001
618.25	2.75	1.93	0.1262	0.0190	0.0001
618.24	2.74	1.93	0.1263	0.0193	0.0001
618.23	2.74	1.92	0.1263	0.0196	0.0001
618.22	2.74	1.91	0.1264	0.0199	0.0001
618.21	2.74	1.90	0.1264	0.0202	0.0001
618.20	2.73	1.89	0.1264	0.0206	0.0001
618.19	2.73	1.89	0.1265	0.0209	0.0001
618.18	2.73	1.88	0.1265	0.0213	0.0001
618.17	2.73	1.87	0.1266	0.0216	0.0001
618.16	2.73	1.86	0.1266	0.0220	0.0001
618.15	2.72	1.86	0.1266	0.0223	0.0001
618.14	2.72	1.85	0.1267	0.0227	0.0001
618.13	2.72	1.84	0.1267	0.0231	0.0001
618.12	2.72	1.83	0.1268	0.0234	0.0001
618.11	2.71	1.83	0.1268	0.0238	0.0001
618.10	2.71	1.82	0.1268	0.0242	0.0001
618.09	2.71	1.81	0.1269	0.0246	0.0001
618.08	2.71	1.80	0.1269	0.0250	0.0001
618.07	2.71	1.79	0.1270	0.0254	0.0001
618.06	2.70	1.79	0.1270	0.0258	0.0001
618.05	2.70	1.78	0.1271	0.0262	0.0001
618.04	2.70	1.77	0.1271	0.0266	0.0001
618.03	2.70	1.76	0.1271	0.0270	0.0001
618.02	2.69	1.76	0.1272	0.0275	0.0001
618.01	2.69	1.75	0.1272	0.0279	0.0001
618.00	2.69	1.74	0.1273	0.0283	0.0001
617.99	2.69	1.73	0.1273	0.0288	0.0001
617.98	2.68	1.72	0.1274	0.0292	0.0001
617.97	2.68	1.72	0.1274	0.0297	0.0001
617.96	2.68	1.71	0.1274	0.0302	0.0001
617.95	2.68	1.70	0.1275	0.0307	0.0001

617.94	2.68	1.69	0.1275	0.0311	0.0001
617.93	2.67	1.69	0.1276	0.0316	0.0001
617.92	2.67	1.68	0.1276	0.0321	0.0001
617.91	2.67	1.67	0.1277	0.0326	0.0001
617.90	2.67	1.66	0.1277	0.0332	0.0001
617.89	2.66	1.66	0.1277	0.0337	0.0001
617.88	2.66	1.65	0.1278	0.0342	0.0001
617.87	2.66	1.64	0.1278	0.0348	0.0002
617.86	2.66	1.63	0.1279	0.0353	0.0002
617.85	2.65	1.62	0.1279	0.0359	0.0002
617.84	2.65	1.62	0.1280	0.0364	0.0002
617.83	2.65	1.61	0.1280	0.0370	0.0002
617.82	2.65	1.60	0.1280	0.0376	0.0002
617.81	2.65	1.59	0.1281	0.0382	0.0002
617.80	2.64	1.59	0.1281	0.0388	0.0002
617.79	2.64	1.58	0.1282	0.0394	0.0002
617.78	2.64	1.57	0.1282	0.0400	0.0002
617.77	2.64	1.56	0.1283	0.0406	0.0002
617.76	2.63	1.55	0.1283	0.0413	0.0002
617.75	2.63	1.55	0.1284	0.0419	0.0002
617.74	2.63	1.54	0.1284	0.0426	0.0002
617.73	2.63	1.53	0.1285	0.0433	0.0002
617.72	2.63	1.52	0.1285	0.0440	0.0002
617.71	2.62	1.52	0.1285	0.0446	0.0002
617.70	2.62	1.51	0.1286	0.0454	0.0002
617.69	2.62	1.50	0.1286	0.0461	0.0002
617.68	2.62	1.49	0.1287	0.0468	0.0002
617.67	2.61	1.49	0.1287	0.0475	0.0002
617.66	2.61	1.48	0.1288	0.0483	0.0002
617.65	2.61	1.47	0.1288	0.0491	0.0002
617.64	2.61	1.46	0.1289	0.0499	0.0002
617.63	2.60	1.45	0.1289	0.0506	0.0002
617.62	2.60	1.45	0.1290	0.0515	0.0002
617.61	2.60	1.44	0.1290	0.0523	0.0002
617.60	2.60	1.43	0.1291	0.0531	0.0002
617.59	2.60	1.42	0.1291	0.0540	0.0002
617.58	2.59	1.42	0.1292	0.0548	0.0002
617.57	2.59	1.41	0.1292	0.0557	0.0002
617.56	2.59	1.40	0.1292	0.0566	0.0002
617.55	2.59	1.39	0.1293	0.0575	0.0003
617.54	2.58	1.39	0.1293	0.0584	0.0003
617.53	2.58	1.38	0.1294	0.0594	0.0003
617.52	2.58	1.37	0.1294	0.0603	0.0003
617.51	2.58	1.36	0.1295	0.0613	0.0003
617.50	2.58	1.35	0.1295	0.0623	0.0003
617.49	2.57	1.35	0.1296	0.0633	0.0003
617.48	2.57	1.34	0.1296	0.0644	0.0003
617.47	2.57	1.33	0.1297	0.0654	0.0003
617.46	2.57	1.32	0.1297	0.0665	0.0003
617.45	2.56	1.32	0.1298	0.0676	0.0003
617.44	2.56	1.31	0.1298	0.0687	0.0003
617.43	2.56	1.30	0.1299	0.0698	0.0003
617.42	2.56	1.29	0.1299	0.0709	0.0003
617.41	2.55	1.28	0.1300	0.0721	0.0003
617.40	2.55	1.28	0.1300	0.0733	0.0003
617.39	2.55	1.27	0.1301	0.0745	0.0003
617.38	2.55	1.26	0.1301	0.0758	0.0003
617.37	2.55	1.25	0.1302	0.0770	0.0003
617.36	2.54	1.25	0.1302	0.0783	0.0003
617.35	2.54	1.24	0.1303	0.0796	0.0003
617.34	2.54	1.23	0.1303	0.0809	0.0004
617.33	2.54	1.22	0.1304	0.0823	0.0004
617.32	2.53	1.22	0.1304	0.0837	0.0004
617.31	2.53	1.21	0.1305	0.0851	0.0004
617.30	2.53	1.20	0.1305	0.0865	0.0004
617.29	2.53	1.19	0.1306	0.0880	0.0004
617.28	2.52	1.18	0.1306	0.0895	0.0004
617.27	2.52	1.18	0.1307	0.0910	0.0004
617.26	2.52	1.17	0.1307	0.0926	0.0004
617.25	2.52	1.16	0.1308	0.0942	0.0004
617.24	2.52	1.15	0.1309	0.0958	0.0004
617.23	2.51	1.15	0.1309	0.0974	0.0004
617.22	2.51	1.14	0.1310	0.0991	0.0004
617.21	2.51	1.13	0.1310	0.1008	0.0004
617.20	2.51	1.12	0.1311	0.1026	0.0004
617.19	2.50	1.11	0.1311	0.1044	0.0005
617.18	2.50	1.11	0.1312	0.1062	0.0005
617.17	2.50	1.10	0.1312	0.1081	0.0005
617.16	2.50	1.09	0.1313	0.1100	0.0005

617.15	2.50	1.08	0.1313	0.1119	0.0005
617.14	2.49	1.08	0.1314	0.1139	0.0005
617.13	2.49	1.07	0.1314	0.1159	0.0005
617.12	2.49	1.06	0.1315	0.1180	0.0005
617.11	2.49	1.05	0.1315	0.1201	0.0005
617.10	2.48	1.05	0.1316	0.1222	0.0005
617.09	2.48	1.04	0.1317	0.1244	0.0005
617.08	2.48	1.03	0.1317	0.1267	0.0006
617.07	2.48	1.02	0.1318	0.1290	0.0006
617.06	2.47	1.01	0.1318	0.1313	0.0006
617.05	2.47	1.01	0.1319	0.1337	0.0006
617.04	2.47	1.00	0.1319	0.1361	0.0006
617.03	2.47	0.99	0.1320	0.1386	0.0006
617.02	2.47	0.98	0.1320	0.1412	0.0006
617.01	2.46	0.98	0.1321	0.1438	0.0006
617.00	2.46	0.97	0.1322	0.1465	0.0006
616.99	2.46	0.96	0.1322	0.1492	0.0007
616.98	2.46	0.95	0.1323	0.1520	0.0007
616.97	2.45	0.95	0.1323	0.1548	0.0007
616.96	2.45	0.94	0.1324	0.1577	0.0007
616.95	2.45	0.93	0.1324	0.1607	0.0007
616.94	2.45	0.92	0.1325	0.1637	0.0007
616.93	2.45	0.91	0.1326	0.1669	0.0007
616.92	2.44	0.91	0.1326	0.1700	0.0007
616.91	2.44	0.90	0.1327	0.1733	0.0008
616.90	2.44	0.89	0.1327	0.1766	0.0008
616.89	2.44	0.88	0.1328	0.1800	0.0008
616.88	2.43	0.88	0.1328	0.1835	0.0008
616.87	2.43	0.87	0.1329	0.1870	0.0008
616.86	2.43	0.86	0.1330	0.1907	0.0008
616.85	2.43	0.85	0.1330	0.1944	0.0008
616.84	2.42	0.84	0.1331	0.1982	0.0009
616.83	2.42	0.84	0.1331	0.2021	0.0009
616.82	2.42	0.83	0.1332	0.2061	0.0009
616.81	2.42	0.82	0.1333	0.2102	0.0009
616.80	2.42	0.81	0.1333	0.2143	0.0009
616.79	2.41	0.81	0.1334	0.2186	0.0010
616.78	2.41	0.80	0.1334	0.2230	0.0010
616.77	2.41	0.79	0.1335	0.2274	0.0010
616.76	2.41	0.78	0.1335	0.2320	0.0010
616.75	2.40	0.78	0.1336	0.2367	0.0010
616.74	2.40	0.77	0.1337	0.2414	0.0011
616.73	2.40	0.76	0.1337	0.2463	0.0011
616.72	2.40	0.75	0.1338	0.2513	0.0011
616.71	2.39	0.74	0.1339	0.2565	0.0011
616.70	2.39	0.74	0.1339	0.2617	0.0011
616.69	2.39	0.73	0.1340	0.2671	0.0012
616.68	2.39	0.72	0.1340	0.2725	0.0012
616.67	2.39	0.71	0.1341	0.2781	0.0012
616.66	2.38	0.71	0.1342	0.2839	0.0012
616.65	2.38	0.70	0.1342	0.2897	0.0013
616.64	2.38	0.69	0.1343	0.2957	0.0013
616.63	2.38	0.68	0.1343	0.3018	0.0013
616.62	2.37	0.67	0.1344	0.3081	0.0013
616.61	2.37	0.67	0.1345	0.3145	0.0014
616.60	2.37	0.66	0.1345	0.3210	0.0014
616.59	2.37	0.65	0.1346	0.3277	0.0014
616.58	2.37	0.64	0.1347	0.3345	0.0015
616.57	2.36	0.64	0.1347	0.3415	0.0015
616.56	2.36	0.63	0.1348	0.3486	0.0015
616.55	2.36	0.62	0.1349	0.3559	0.0016
616.54	2.36	0.61	0.1349	0.3633	0.0016
616.53	2.35	0.61	0.1350	0.3708	0.0016
616.52	2.35	0.60	0.1350	0.3785	0.0017
616.51	2.35	0.59	0.1351	0.3864	0.0017
616.50	2.35	0.58	0.1352	0.3944	0.0017
616.49	2.34	0.57	0.1352	0.4025	0.0018
616.48	2.34	0.57	0.1353	0.4108	0.0018
616.47	2.34	0.56	0.1354	0.4193	0.0018
616.46	2.34	0.55	0.1354	0.4278	0.0019
616.45	2.34	0.54	0.1355	0.4366	0.0019
616.44	2.33	0.54	0.1356	0.4454	0.0019
616.43	2.33	0.53	0.1356	0.4544	0.0020
616.42	2.33	0.52	0.1357	0.4635	0.0020
616.41	2.33	0.51	0.1358	0.4728	0.0021
616.40	2.32	0.51	0.1358	0.4822	0.0021
616.39	2.32	0.50	0.1359	0.4917	0.0021
616.38	2.32	0.49	0.1360	0.5013	0.0022
616.37	2.32	0.48	0.1360	0.5110	0.0022

616.36	2.32	0.47	0.1361	0.5208	0.0023
616.35	2.31	0.47	0.1362	0.5306	0.0023
616.34	2.31	0.46	0.1362	0.5406	0.0024
616.33	2.31	0.45	0.1363	0.5506	0.0024
616.32	2.31	0.44	0.1364	0.5607	0.0025
616.31	2.30	0.44	0.1365	0.5708	0.0025
616.30	2.30	0.43	0.1365	0.5810	0.0025
616.29	2.30	0.42	0.1366	0.5911	0.0026
616.28	2.30	0.41	0.1367	0.6013	0.0026
616.27	2.29	0.40	0.1367	0.6115	0.0027
616.26	2.29	0.40	0.1368	0.6216	0.0027
616.25	2.29	0.39	0.1369	0.6317	0.0028
616.24	2.29	0.38	0.1369	0.6417	0.0028
616.23	2.29	0.37	0.1370	0.6517	0.0028
616.22	2.28	0.37	0.1371	0.6616	0.0029
616.21	2.28	0.36	0.1372	0.6713	0.0029
616.20	2.28	0.35	0.1372	0.6810	0.0030
616.19	2.28	0.34	0.1373	0.6905	0.0030
616.18	2.27	0.34	0.1374	0.6998	0.0031
616.17	2.27	0.33	0.1374	0.7090	0.0031
616.16	2.27	0.32	0.1375	0.7180	0.0031
616.15	2.27	0.31	0.1376	0.7267	0.0032
616.14	2.26	0.30	0.1377	0.7353	0.0032
616.13	2.26	0.30	0.1377	0.7436	0.0032
616.12	2.26	0.29	0.1378	0.7516	0.0033
616.11	2.26	0.28	0.1379	0.7594	0.0033
616.10	2.26	0.27	0.1380	0.7669	0.0034
616.09	2.25	0.27	0.1380	0.7741	0.0034
616.08	2.25	0.26	0.1381	0.7810	0.0034
616.07	2.25	0.25	0.1382	0.7877	0.0034
616.06	2.25	0.24	0.1382	0.7940	0.0035
616.05	2.24	0.23	0.1383	0.7999	0.0035
616.04	2.24	0.23	0.1384	0.8056	0.0035
616.03	2.24	0.22	0.1385	0.8110	0.0035
616.02	2.24	0.21	0.1386	0.8160	0.0036
616.01	2.24	0.20	0.1386	0.8207	0.0036
616.00	2.23	0.20	0.1387	0.8251	0.0036
615.99	2.23	0.19	0.1388	0.8292	0.0036
615.98	2.23	0.18	0.1389	0.8329	0.0036
615.97	2.23	0.17	0.1389	0.8364	0.0037
615.96	2.22	0.17	0.1390	0.8395	0.0037
615.95	2.22	0.16	0.1391	0.8424	0.0037
615.94	2.22	0.15	0.1392	0.8450	0.0037
615.93	2.22	0.14	0.1392	0.8473	0.0037
615.92	2.21	0.13	0.1393	0.8494	0.0037
615.91	2.21	0.13	0.1394	0.8512	0.0037
615.90	2.21	0.12	0.1395	0.8528	0.0037
615.89	2.21	0.11	0.1396	0.8542	0.0037
615.88	2.21	0.10	0.1396	0.8554	0.0037
615.87	2.20	0.10	0.1397	0.8564	0.0037
615.86	2.20	0.09	0.1398	0.8572	0.0037
615.85	2.20	0.08	0.1399	0.8579	0.0037
615.84	2.20	0.07	0.1400	0.8584	0.0038
615.83	2.19	0.06	0.1400	0.8588	0.0038
615.82	2.19	0.06	0.1401	0.8591	0.0038
615.81	2.19	0.05	0.1402	0.8593	0.0038
615.80	2.19	0.04	0.1403	0.8594	0.0038
615.79	2.19	0.03	0.1404	0.8595	0.0038
615.78	2.18	0.03	0.1404	0.8595	0.0038
615.77	2.18	0.02	0.1405	0.8595	0.0038
615.76	2.18	0.01	0.1406	0.8594	0.0038
615.75	2.18	0.00	0.1407	0.8593	0.0038
615.74	2.17	0.00	0.1408	0.8592	0.0038
615.73	2.17	0.00	0.1409	0.8591	0.0038
615.72	2.17	0.00	0.1409	0.8591	0.0038
615.71	2.17	0.00	0.1410	0.8590	0.0038
615.70	2.16	0.00	0.1411	0.8589	0.0038
615.69	2.16	0.00	0.1412	0.8588	0.0038
615.68	2.16	0.00	0.1413	0.8587	0.0038
615.67	2.16	0.00	0.1414	0.8586	0.0038
615.66	2.16	0.00	0.1414	0.8586	0.0038
615.65	2.15	0.00	0.1415	0.8585	0.0038
615.64	2.15	0.00	0.1416	0.8584	0.0038
615.63	2.15	0.00	0.1417	0.8583	0.0038
615.62	2.15	0.00	0.1418	0.8582	0.0038
615.61	2.14	0.00	0.1419	0.8581	0.0038
615.60	2.14	0.00	0.1420	0.8580	0.0037
615.59	2.14	0.00	0.1420	0.8580	0.0037
615.58	2.14	0.00	0.1421	0.8579	0.0037

615.57	2.14	0.00	0.1422	0.8578	0.0037
615.56	2.13	0.00	0.1423	0.8577	0.0037
615.55	2.13	0.00	0.1424	0.8576	0.0037
615.54	2.13	0.00	0.1425	0.8575	0.0037
615.53	2.13	0.00	0.1426	0.8574	0.0037
615.52	2.12	0.00	0.1427	0.8573	0.0037
615.51	2.12	0.00	0.1427	0.8573	0.0037
615.50	2.12	0.00	0.1428	0.8572	0.0037
615.49	2.12	0.00	0.1429	0.8571	0.0037
615.48	2.11	0.00	0.1430	0.8570	0.0037
615.47	2.11	0.00	0.1431	0.8569	0.0037
615.46	2.11	0.00	0.1432	0.8568	0.0037
615.45	2.11	0.00	0.1433	0.8567	0.0037
615.44	2.11	0.00	0.1434	0.8566	0.0037
615.43	2.10	0.00	0.1435	0.8565	0.0037
615.42	2.10	0.00	0.1436	0.8564	0.0037
615.41	2.10	0.00	0.1437	0.8563	0.0037
615.40	2.10	0.00	0.1437	0.8563	0.0037
615.39	2.09	0.00	0.1438	0.8562	0.0037
615.38	2.09	0.00	0.1439	0.8561	0.0037
615.37	2.09	0.00	0.1440	0.8560	0.0037
615.36	2.09	0.00	0.1441	0.8559	0.0037
615.35	2.08	0.00	0.1442	0.8558	0.0037
615.34	2.08	0.00	0.1443	0.8557	0.0037
615.33	2.08	0.00	0.1444	0.8556	0.0037
615.32	2.08	0.00	0.1445	0.8555	0.0037
615.31	2.08	0.00	0.1446	0.8554	0.0037
615.30	2.07	0.00	0.1447	0.8553	0.0037
615.29	2.07	0.00	0.1448	0.8552	0.0037
615.28	2.07	0.00	0.1449	0.8551	0.0037
615.27	2.07	0.00	0.1450	0.8550	0.0037
615.26	2.06	0.00	0.1451	0.8549	0.0037
615.25	2.06	0.00	0.1452	0.8548	0.0037
615.24	2.06	0.00	0.1453	0.8547	0.0037
615.23	2.06	0.00	0.1454	0.8546	0.0037
615.22	2.06	0.00	0.1455	0.8545	0.0037
615.21	2.05	0.00	0.1456	0.8544	0.0037
615.20	2.05	0.00	0.1457	0.8543	0.0037
615.19	2.05	0.00	0.1458	0.8542	0.0037
615.18	2.05	0.00	0.1459	0.8541	0.0037
615.17	2.04	0.00	0.1460	0.8540	0.0037
615.16	2.04	0.00	0.1461	0.8539	0.0037
615.15	2.04	0.00	0.1462	0.8538	0.0037
615.14	2.04	0.00	0.1463	0.8537	0.0037
615.13	2.03	0.00	0.1464	0.8536	0.0037
615.12	2.03	0.00	0.1465	0.8535	0.0037
615.11	2.03	0.00	0.1466	0.8534	0.0037
615.10	2.03	0.00	0.1467	0.8533	0.0037
615.09	2.03	0.00	0.1468	0.8532	0.0037
615.08	2.02	0.00	0.1469	0.8531	0.0037
615.07	2.02	0.00	0.1470	0.8530	0.0037
615.06	2.02	0.00	0.1471	0.8529	0.0037
615.05	2.02	0.00	0.1472	0.8528	0.0037
615.04	2.01	0.00	0.1473	0.8527	0.0037
615.03	2.01	0.00	0.1474	0.8526	0.0037
615.02	2.01	0.00	0.1475	0.8525	0.0037
615.01	2.01	0.00	0.1476	0.8524	0.0037
615.00	2.01	0.00	0.1477	0.8523	0.0037
614.99	2.00	0.00	0.1478	0.8522	0.0037
614.98	2.00	0.00	0.1479	0.8521	0.0037
614.97	2.00	0.00	0.1480	0.8520	0.0037
614.96	2.00	0.00	0.1482	0.8518	0.0037
614.95	1.99	0.00	0.1483	0.8517	0.0037
614.94	1.99	0.00	0.1484	0.8516	0.0037
614.93	1.99	0.00	0.1485	0.8515	0.0037
614.92	1.99	0.00	0.1486	0.8514	0.0037
614.91	1.98	0.00	0.1487	0.8513	0.0037
614.90	1.98	0.00	0.1488	0.8512	0.0037
614.89	1.98	0.00	0.1489	0.8511	0.0037
614.88	1.98	0.00	0.1490	0.8510	0.0037
614.87	1.98	0.00	0.1491	0.8509	0.0037
614.86	1.97	0.00	0.1493	0.8507	0.0037
614.85	1.97	0.00	0.1494	0.8506	0.0037
614.84	1.97	0.00	0.1495	0.8505	0.0037
614.83	1.97	0.00	0.1496	0.8504	0.0037
614.82	1.96	0.00	0.1497	0.8503	0.0037
614.81	1.96	0.00	0.1498	0.8502	0.0037
614.80	1.96	0.00	0.1499	0.8501	0.0037
614.79	1.96	0.00	0.1501	0.8499	0.0037

614.78	1.95	0.00	0.1502	0.8498	0.0037
614.77	1.95	0.00	0.1503	0.8497	0.0037
614.76	1.95	0.00	0.1504	0.8496	0.0037
614.75	1.95	0.00	0.1505	0.8495	0.0037
614.74	1.95	0.00	0.1506	0.8494	0.0037
614.73	1.94	0.00	0.1507	0.8493	0.0037
614.72	1.94	0.00	0.1509	0.8491	0.0037
614.71	1.94	0.00	0.1510	0.8490	0.0037
614.70	1.94	0.00	0.1511	0.8489	0.0037
614.69	1.93	0.00	0.1512	0.8488	0.0037
614.68	1.93	0.00	0.1513	0.8487	0.0037
614.67	1.93	0.00	0.1515	0.8485	0.0037
614.66	1.93	0.00	0.1516	0.8484	0.0037
614.65	1.93	0.00	0.1517	0.8483	0.0037
614.64	1.92	0.00	0.1518	0.8482	0.0037
614.63	1.92	0.00	0.1519	0.8481	0.0037
614.62	1.92	0.00	0.1521	0.8479	0.0037
614.61	1.92	0.00	0.1522	0.8478	0.0037
614.60	1.91	0.00	0.1523	0.8477	0.0037
614.59	1.91	0.00	0.1524	0.8476	0.0037
614.58	1.91	0.00	0.1526	0.8474	0.0037
614.57	1.91	0.00	0.1527	0.8473	0.0037
614.56	1.90	0.00	0.1528	0.8472	0.0037
614.55	1.90	0.00	0.1529	0.8471	0.0037
614.54	1.90	0.00	0.1531	0.8469	0.0037
614.53	1.90	0.00	0.1532	0.8468	0.0037
614.52	1.90	0.00	0.1533	0.8467	0.0037
614.51	1.89	0.00	0.1534	0.8466	0.0037
614.50	1.89	0.00	0.1536	0.8464	0.0037
614.49	1.89	0.00	0.1537	0.8463	0.0037
614.48	1.89	0.00	0.1538	0.8462	0.0037
614.47	1.88	0.00	0.1540	0.8460	0.0037
614.46	1.88	0.00	0.1541	0.8459	0.0037
614.45	1.88	0.00	0.1542	0.8458	0.0037
614.44	1.88	0.00	0.1543	0.8457	0.0037
614.43	1.88	0.00	0.1545	0.8455	0.0037
614.42	1.87	0.00	0.1546	0.8454	0.0037
614.41	1.87	0.00	0.1547	0.8453	0.0037
614.40	1.87	0.00	0.1549	0.8451	0.0037
614.39	1.87	0.00	0.1550	0.8450	0.0037
614.38	1.86	0.00	0.1551	0.8449	0.0037
614.37	1.86	0.00	0.1553	0.8447	0.0037
614.36	1.86	0.00	0.1554	0.8446	0.0037
614.35	1.86	0.00	0.1555	0.8445	0.0037
614.34	1.85	0.00	0.1557	0.8443	0.0037
614.33	1.85	0.00	0.1558	0.8442	0.0037
614.32	1.85	0.00	0.1559	0.8441	0.0037
614.31	1.85	0.00	0.1561	0.8439	0.0037
614.30	1.85	0.00	0.1562	0.8438	0.0037
614.29	1.84	0.00	0.1564	0.8436	0.0037
614.28	1.84	0.00	0.1565	0.8435	0.0037
614.27	1.84	0.00	0.1566	0.8434	0.0037
614.26	1.84	0.00	0.1568	0.8432	0.0037
614.25	1.83	0.00	0.1569	0.8431	0.0037
614.24	1.83	0.00	0.1571	0.8429	0.0037
614.23	1.83	0.00	0.1572	0.8428	0.0037
614.22	1.83	0.00	0.1573	0.8427	0.0037
614.21	1.82	0.00	0.1575	0.8425	0.0037
614.20	1.82	0.00	0.1576	0.8424	0.0037
614.19	1.82	0.00	0.1578	0.8422	0.0037
614.18	1.82	0.00	0.1579	0.8421	0.0037
614.17	1.82	0.00	0.1581	0.8419	0.0037
614.16	1.81	0.00	0.1582	0.8418	0.0037
614.15	1.81	0.00	0.1584	0.8416	0.0037
614.14	1.81	0.00	0.1585	0.8415	0.0037
614.13	1.81	0.00	0.1586	0.8414	0.0037
614.12	1.80	0.00	0.1588	0.8412	0.0037
614.11	1.80	0.00	0.1589	0.8411	0.0037
614.10	1.80	0.00	0.1591	0.8409	0.0037
614.09	1.80	0.00	0.1592	0.8408	0.0037
614.08	1.80	0.00	0.1594	0.8406	0.0037
614.07	1.79	0.00	0.1595	0.8405	0.0037
614.06	1.79	0.00	0.1597	0.8403	0.0037
614.05	1.79	0.00	0.1598	0.8402	0.0037
614.04	1.79	0.00	0.1600	0.8400	0.0037
614.03	1.78	0.00	0.1601	0.8399	0.0037
614.02	1.78	0.00	0.1603	0.8397	0.0037
614.01	1.78	0.00	0.1605	0.8395	0.0037
614.00	1.78	0.00	0.1606	0.8394	0.0037



613.99	1.77	0.00	0.1608	0.8392	0.0037
613.98	1.77	0.00	0.1609	0.8391	0.0037
613.97	1.77	0.00	0.1611	0.8389	0.0037
613.96	1.77	0.00	0.1612	0.8388	0.0037
613.95	1.77	0.00	0.1614	0.8386	0.0037
613.94	1.76	0.00	0.1615	0.8385	0.0037
613.93	1.76	0.00	0.1617	0.8383	0.0037
613.92	1.76	0.00	0.1619	0.8381	0.0037
613.91	1.76	0.00	0.1620	0.8380	0.0037
613.90	1.75	0.00	0.1622	0.8378	0.0037
613.89	1.75	0.00	0.1623	0.8377	0.0037
613.88	1.75	0.00	0.1625	0.8375	0.0037
613.87	1.75	0.00	0.1627	0.8373	0.0037
613.86	1.75	0.00	0.1628	0.8372	0.0037
613.85	1.74	0.00	0.1630	0.8370	0.0037
613.84	1.74	0.00	0.1632	0.8368	0.0037
613.83	1.74	0.00	0.1633	0.8367	0.0037
613.82	1.74	0.00	0.1635	0.8365	0.0037
613.81	1.73	0.00	0.1637	0.8363	0.0037
613.80	1.73	0.00	0.1638	0.8362	0.0037
613.79	1.73	0.00	0.1640	0.8360	0.0037
613.78	1.73	0.00	0.1642	0.8358	0.0037
613.77	1.72	0.00	0.1643	0.8357	0.0037
613.76	1.72	0.00	0.1645	0.8355	0.0037
613.75	1.72	0.00	0.1647	0.8353	0.0037
613.74	1.72	0.00	0.1649	0.8351	0.0036
613.73	1.72	0.00	0.1650	0.8350	0.0036
613.72	1.71	0.00	0.1652	0.8348	0.0036
613.71	1.71	0.00	0.1654	0.8346	0.0036
613.70	1.71	0.00	0.1655	0.8345	0.0036
613.69	1.71	0.00	0.1657	0.8343	0.0036
613.68	1.70	0.00	0.1659	0.8341	0.0036
613.67	1.70	0.00	0.1661	0.8339	0.0036
613.66	1.70	0.00	0.1663	0.8337	0.0036
613.65	1.70	0.00	0.1664	0.8336	0.0036
613.64	1.69	0.00	0.1666	0.8334	0.0036
613.63	1.69	0.00	0.1668	0.8332	0.0036
613.62	1.69	0.00	0.1670	0.8330	0.0036
613.61	1.69	0.00	0.1671	0.8329	0.0036
613.60	1.69	0.00	0.1673	0.8327	0.0036
613.59	1.68	0.00	0.1675	0.8325	0.0036
613.58	1.68	0.00	0.1677	0.8323	0.0036
613.57	1.68	0.00	0.1679	0.8321	0.0036
613.56	1.68	0.00	0.1681	0.8319	0.0036
613.55	1.67	0.00	0.1682	0.8318	0.0036
613.54	1.67	0.00	0.1684	0.8316	0.0036
613.53	1.67	0.00	0.1686	0.8314	0.0036
613.52	1.67	0.00	0.1688	0.8312	0.0036
613.51	1.67	0.00	0.1690	0.8310	0.0036
613.50	1.66	0.00	0.1692	0.8308	0.0036
613.49	1.66	0.00	0.1694	0.8306	0.0036
613.48	1.66	0.00	0.1696	0.8304	0.0036
613.47	1.66	0.00	0.1698	0.8302	0.0036
613.46	1.65	0.00	0.1700	0.8300	0.0036
613.45	1.65	0.00	0.1701	0.8299	0.0036
613.44	1.65	0.00	0.1703	0.8297	0.0036
613.43	1.65	0.00	0.1705	0.8295	0.0036
613.42	1.64	0.00	0.1707	0.8293	0.0036
613.41	1.64	0.00	0.1709	0.8291	0.0036
613.40	1.64	0.00	0.1711	0.8289	0.0036
613.39	1.64	0.00	0.1713	0.8287	0.0036
613.38	1.64	0.00	0.1715	0.8285	0.0036
613.37	1.63	0.00	0.1717	0.8283	0.0036
613.36	1.63	0.00	0.1719	0.8281	0.0036
613.35	1.63	0.00	0.1721	0.8279	0.0036
613.34	1.63	0.00	0.1723	0.8277	0.0036
613.33	1.62	0.00	0.1725	0.8275	0.0036
613.32	1.62	0.00	0.1727	0.8273	0.0036
613.31	1.62	0.00	0.1729	0.8271	0.0036
613.30	1.62	0.00	0.1732	0.8268	0.0036
613.29	1.62	0.00	0.1734	0.8266	0.0036
613.28	1.61	0.00	0.1736	0.8264	0.0036
613.27	1.61	0.00	0.1738	0.8262	0.0036
613.26	1.61	0.00	0.1740	0.8260	0.0036
613.25	1.61	0.00	0.1742	0.8258	0.0036
613.24	1.60	0.00	0.1744	0.8256	0.0036
613.23	1.60	0.00	0.1746	0.8254	0.0036
613.22	1.60	0.00	0.1748	0.8252	0.0036
613.21	1.60	0.00	0.1750	0.8250	0.0036

613.20	1.59	0.00	0.1753	0.8247	0.0036
613.19	1.59	0.00	0.1755	0.8245	0.0036
613.18	1.59	0.00	0.1757	0.8243	0.0036
613.17	1.59	0.00	0.1759	0.8241	0.0036
613.16	1.59	0.00	0.1761	0.8239	0.0036
613.15	1.58	0.00	0.1764	0.8236	0.0036
613.14	1.58	0.00	0.1766	0.8234	0.0036
613.13	1.58	0.00	0.1768	0.8232	0.0036
613.12	1.58	0.00	0.1770	0.8230	0.0036
613.11	1.57	0.00	0.1772	0.8228	0.0036
613.10	1.57	0.00	0.1775	0.8225	0.0036
613.09	1.57	0.00	0.1777	0.8223	0.0036
613.08	1.57	0.00	0.1779	0.8221	0.0036
613.07	1.57	0.00	0.1782	0.8218	0.0036
613.06	1.56	0.00	0.1784	0.8216	0.0036
613.05	1.56	0.00	0.1786	0.8214	0.0036
613.04	1.56	0.00	0.1788	0.8212	0.0036
613.03	1.56	0.00	0.1791	0.8209	0.0036
613.02	1.55	0.00	0.1793	0.8207	0.0036
613.01	1.55	0.00	0.1795	0.8205	0.0036
613.00	1.55	0.00	0.1798	0.8202	0.0036
612.99	1.55	0.00	0.1800	0.8200	0.0036
612.98	1.54	0.00	0.1803	0.8197	0.0036
612.97	1.54	0.00	0.1805	0.8195	0.0036
612.96	1.54	0.00	0.1807	0.8193	0.0036
612.95	1.54	0.00	0.1810	0.8190	0.0036
612.94	1.54	0.00	0.1812	0.8188	0.0036
612.93	1.53	0.00	0.1815	0.8185	0.0036
612.92	1.53	0.00	0.1817	0.8183	0.0036
612.91	1.53	0.00	0.1819	0.8181	0.0036
612.90	1.53	0.00	0.1822	0.8178	0.0036
612.89	1.52	0.00	0.1824	0.8176	0.0036
612.88	1.52	0.00	0.1827	0.8173	0.0036
612.87	1.52	0.00	0.1829	0.8171	0.0036
612.86	1.52	0.00	0.1832	0.8168	0.0036
612.85	1.51	0.00	0.1834	0.8166	0.0036
612.84	1.51	0.00	0.1837	0.8163	0.0036
612.83	1.51	0.00	0.1839	0.8161	0.0036
612.82	1.51	0.00	0.1842	0.8158	0.0036
612.81	1.51	0.00	0.1845	0.8155	0.0036
612.80	1.50	0.00	0.1847	0.8153	0.0036
612.79	1.50	0.00	0.1850	0.8150	0.0036
612.78	1.50	0.00	0.1852	0.8148	0.0036
612.77	1.50	0.00	0.1855	0.8145	0.0036
612.76	1.49	0.00	0.1858	0.8142	0.0036
612.75	1.49	0.00	0.1860	0.8140	0.0036
612.74	1.49	0.00	0.1863	0.8137	0.0036
612.73	1.49	0.00	0.1865	0.8135	0.0036
612.72	1.49	0.00	0.1868	0.8132	0.0036
612.71	1.48	0.00	0.1871	0.8129	0.0036
612.70	1.48	0.00	0.1874	0.8126	0.0036
612.69	1.48	0.00	0.1876	0.8124	0.0036
612.68	1.48	0.00	0.1879	0.8121	0.0035
612.67	1.47	0.00	0.1882	0.8118	0.0035
612.66	1.47	0.00	0.1884	0.8116	0.0035
612.65	1.47	0.00	0.1887	0.8113	0.0035
612.64	1.47	0.00	0.1890	0.8110	0.0035
612.63	1.46	0.00	0.1893	0.8107	0.0035
612.62	1.46	0.00	0.1896	0.8104	0.0035
612.61	1.46	0.00	0.1898	0.8102	0.0035
612.60	1.46	0.00	0.1901	0.8099	0.0035
612.59	1.46	0.00	0.1904	0.8096	0.0035
612.58	1.45	0.00	0.1907	0.8093	0.0035
612.57	1.45	0.00	0.1910	0.8090	0.0035
612.56	1.45	0.00	0.1913	0.8087	0.0035
612.55	1.45	0.00	0.1916	0.8084	0.0035
612.54	1.44	0.00	0.1918	0.8082	0.0035
612.53	1.44	0.00	0.1921	0.8079	0.0035
612.52	1.44	0.00	0.1924	0.8076	0.0035
612.51	1.44	0.00	0.1927	0.8073	0.0035
612.50	1.44	0.00	0.1930	0.8070	0.0035
612.49	1.43	0.00	0.1933	0.8067	0.0035
612.48	1.43	0.00	0.1936	0.8064	0.0035
612.47	1.43	0.00	0.1939	0.8061	0.0035
612.46	1.43	0.00	0.1942	0.8058	0.0035
612.45	1.42	0.00	0.1945	0.8055	0.0035
612.44	1.42	0.00	0.1948	0.8052	0.0035
612.43	1.42	0.00	0.1951	0.8049	0.0035
612.42	1.42	0.00	0.1954	0.8046	0.0035

612.41	1.41	0.00	0.1957	0.8043	0.0035
612.40	1.41	0.00	0.1961	0.8039	0.0035
612.39	1.41	0.00	0.1964	0.8036	0.0035
612.38	1.41	0.00	0.1967	0.8033	0.0035
612.37	1.41	0.00	0.1970	0.8030	0.0035
612.36	1.40	0.00	0.1973	0.8027	0.0035
612.35	1.40	0.00	0.1976	0.8024	0.0035
612.34	1.40	0.00	0.1980	0.8020	0.0035
612.33	1.40	0.00	0.1983	0.8017	0.0035
612.32	1.39	0.00	0.1986	0.8014	0.0035
612.31	1.39	0.00	0.1989	0.8011	0.0035
612.30	1.39	0.00	0.1992	0.8008	0.0035
612.29	1.39	0.00	0.1996	0.8004	0.0035
612.28	1.38	0.00	0.1999	0.8001	0.0035
612.27	1.38	0.00	0.2002	0.7998	0.0035
612.26	1.38	0.00	0.2006	0.7994	0.0035
612.25	1.38	0.00	0.2009	0.7991	0.0035
612.24	1.38	0.00	0.2012	0.7988	0.0035
612.23	1.37	0.00	0.2016	0.7984	0.0035
612.22	1.37	0.00	0.2019	0.7981	0.0035
612.21	1.37	0.00	0.2023	0.7977	0.0035
612.20	1.37	0.00	0.2026	0.7974	0.0035
612.19	1.36	0.00	0.2029	0.7971	0.0035
612.18	1.36	0.00	0.2033	0.7967	0.0035
612.17	1.36	0.00	0.2036	0.7964	0.0035
612.16	1.36	0.00	0.2040	0.7960	0.0035
612.15	1.36	0.00	0.2043	0.7957	0.0035
612.14	1.35	0.00	0.2047	0.7953	0.0035
612.13	1.35	0.00	0.2050	0.7950	0.0035
612.12	1.35	0.00	0.2054	0.7946	0.0035
612.11	1.35	0.00	0.2058	0.7942	0.0035
612.10	1.34	0.00	0.2061	0.7939	0.0035
612.09	1.34	0.00	0.2065	0.7935	0.0035
612.08	1.34	0.00	0.2068	0.7932	0.0035
612.07	1.34	0.00	0.2072	0.7928	0.0035
612.06	1.33	0.00	0.2076	0.7924	0.0035
612.05	1.33	0.00	0.2079	0.7921	0.0035
612.04	1.33	0.00	0.2083	0.7917	0.0035
612.03	1.33	0.00	0.2087	0.7913	0.0035
612.02	1.33	0.00	0.2091	0.7909	0.0035
612.01	1.32	0.00	0.2094	0.7906	0.0035
612.00	1.32	0.00	0.2098	0.7902	0.0035
611.99	1.32	0.00	0.2102	0.7898	0.0035
611.98	1.32	0.00	0.2106	0.7894	0.0034
611.97	1.31	0.00	0.2110	0.7890	0.0034
611.96	1.31	0.00	0.2114	0.7886	0.0034
611.95	1.31	0.00	0.2117	0.7883	0.0034
611.94	1.31	0.00	0.2121	0.7879	0.0034
611.93	1.31	0.00	0.2125	0.7875	0.0034
611.92	1.30	0.00	0.2129	0.7871	0.0034
611.91	1.30	0.00	0.2133	0.7867	0.0034
611.90	1.30	0.00	0.2137	0.7863	0.0034
611.89	1.30	0.00	0.2141	0.7859	0.0034
611.88	1.29	0.00	0.2145	0.7855	0.0034
611.87	1.29	0.00	0.2149	0.7851	0.0034
611.86	1.29	0.00	0.2153	0.7847	0.0034
611.85	1.29	0.00	0.2157	0.7843	0.0034
611.84	1.28	0.00	0.2161	0.7839	0.0034
611.83	1.28	0.00	0.2166	0.7834	0.0034
611.82	1.28	0.00	0.2170	0.7830	0.0034
611.81	1.28	0.00	0.2174	0.7826	0.0034
611.80	1.28	0.00	0.2178	0.7822	0.0034
611.79	1.27	0.00	0.2182	0.7818	0.0034
611.78	1.27	0.00	0.2187	0.7813	0.0034
611.77	1.27	0.00	0.2191	0.7809	0.0034
611.76	1.27	0.00	0.2195	0.7805	0.0034
611.75	1.26	0.00	0.2199	0.7801	0.0034
611.74	1.26	0.00	0.2204	0.7796	0.0034
611.73	1.26	0.00	0.2208	0.7792	0.0034
611.72	1.26	0.00	0.2212	0.7788	0.0034
611.71	1.25	0.00	0.2217	0.7783	0.0034
611.70	1.25	0.00	0.2221	0.7779	0.0034
611.69	1.25	0.00	0.2226	0.7774	0.0034
611.68	1.25	0.00	0.2230	0.7770	0.0034
611.67	1.25	0.00	0.2235	0.7765	0.0034
611.66	1.24	0.00	0.2239	0.7761	0.0034
611.65	1.24	0.00	0.2244	0.7756	0.0034
611.64	1.24	0.00	0.2248	0.7752	0.0034
611.63	1.24	0.00	0.2253	0.7747	0.0034

611.62	1.23	0.00	0.2257	0.7743	0.0034
611.61	1.23	0.00	0.2262	0.7738	0.0034
611.60	1.23	0.00	0.2267	0.7733	0.0034
611.59	1.23	0.00	0.2271	0.7729	0.0034
611.58	1.23	0.00	0.2276	0.7724	0.0034
611.57	1.22	0.00	0.2281	0.7719	0.0034
611.56	1.22	0.00	0.2286	0.7714	0.0034
611.55	1.22	0.00	0.2290	0.7710	0.0034
611.54	1.22	0.00	0.2295	0.7705	0.0034
611.53	1.21	0.00	0.2300	0.7700	0.0034
611.52	1.21	0.00	0.2305	0.7695	0.0034
611.51	1.21	0.00	0.2310	0.7690	0.0034
611.50	1.21	0.00	0.2315	0.7685	0.0034
611.49	1.20	0.00	0.2320	0.7680	0.0034
611.48	1.20	0.00	0.2325	0.7675	0.0034
611.47	1.20	0.00	0.2330	0.7670	0.0034
611.46	1.20	0.00	0.2335	0.7665	0.0033
611.45	1.20	0.00	0.2340	0.7660	0.0033
611.44	1.19	0.00	0.2345	0.7655	0.0033
611.43	1.19	0.00	0.2350	0.7650	0.0033
611.42	1.19	0.00	0.2355	0.7645	0.0033
611.41	1.19	0.00	0.2360	0.7640	0.0033
611.40	1.18	0.00	0.2365	0.7635	0.0033
611.39	1.18	0.00	0.2371	0.7629	0.0033
611.38	1.18	0.00	0.2376	0.7624	0.0033
611.37	1.18	0.00	0.2381	0.7619	0.0033
611.36	1.18	0.00	0.2387	0.7613	0.0033
611.35	1.17	0.00	0.2392	0.7608	0.0033
611.34	1.17	0.00	0.2397	0.7603	0.0033
611.33	1.17	0.00	0.2403	0.7597	0.0033
611.32	1.17	0.00	0.2408	0.7592	0.0033
611.31	1.16	0.00	0.2414	0.7586	0.0033
611.30	1.16	0.00	0.2419	0.7581	0.0033
611.29	1.16	0.00	0.2425	0.7575	0.0033
611.28	1.16	0.00	0.2430	0.7570	0.0033
611.27	1.15	0.00	0.2436	0.7564	0.0033
611.26	1.15	0.00	0.2441	0.7559	0.0033
611.25	1.15	0.00	0.2447	0.7553	0.0033
611.24	1.15	0.00	0.2453	0.7547	0.0033
611.23	1.15	0.00	0.2458	0.7542	0.0033
611.22	1.14	0.00	0.2464	0.7536	0.0033
611.21	1.14	0.00	0.2470	0.7530	0.0033
611.20	1.14	0.00	0.2476	0.7524	0.0033
611.19	1.14	0.00	0.2481	0.7519	0.0033
611.18	1.13	0.00	0.2487	0.7513	0.0033
611.17	1.13	0.00	0.2493	0.7507	0.0033
611.16	1.13	0.00	0.2499	0.7501	0.0033
611.15	1.13	0.00	0.2505	0.7495	0.0033
611.14	1.12	0.00	0.2511	0.7489	0.0033
611.13	1.12	0.00	0.2517	0.7483	0.0033
611.12	1.12	0.00	0.2523	0.7477	0.0033
611.11	1.12	0.00	0.2529	0.7471	0.0033
611.10	1.12	0.00	0.2536	0.7464	0.0033
611.09	1.11	0.00	0.2542	0.7458	0.0033
611.08	1.11	0.00	0.2548	0.7452	0.0033
611.07	1.11	0.00	0.2554	0.7446	0.0033
611.06	1.11	0.00	0.2560	0.7440	0.0033
611.05	1.10	0.00	0.2567	0.7433	0.0032
611.04	1.10	0.00	0.2573	0.7427	0.0032
611.03	1.10	0.00	0.2579	0.7421	0.0032
611.02	1.10	0.00	0.2586	0.7414	0.0032
611.01	1.10	0.00	0.2592	0.7408	0.0032
611.00	1.09	0.00	0.2599	0.7401	0.0032
610.99	1.09	0.00	0.2605	0.7395	0.0032
610.98	1.09	0.00	0.2612	0.7388	0.0032
610.97	1.09	0.00	0.2619	0.7381	0.0032
610.96	1.08	0.00	0.2625	0.7375	0.0032
610.95	1.08	0.00	0.2632	0.7368	0.0032
610.94	1.08	0.00	0.2639	0.7361	0.0032
610.93	1.08	0.00	0.2645	0.7355	0.0032
610.92	1.07	0.00	0.2652	0.7348	0.0032
610.91	1.07	0.00	0.2659	0.7341	0.0032
610.90	1.07	0.00	0.2666	0.7334	0.0032
610.89	1.07	0.00	0.2673	0.7327	0.0032
610.88	1.07	0.00	0.2680	0.7320	0.0032
610.87	1.06	0.00	0.2687	0.7313	0.0032
610.86	1.06	0.00	0.2694	0.7306	0.0032
610.85	1.06	0.00	0.2701	0.7299	0.0032
610.84	1.06	0.00	0.2708	0.7292	0.0032

610.83	1.05	0.00	0.2715	0.7285	0.0032
610.82	1.05	0.00	0.2723	0.7277	0.0032
610.81	1.05	0.00	0.2730	0.7270	0.0032
610.80	1.05	0.00	0.2737	0.7263	0.0032
610.79	1.05	0.00	0.2745	0.7255	0.0032
610.78	1.04	0.00	0.2752	0.7248	0.0032
610.77	1.04	0.00	0.2759	0.7241	0.0032
610.76	1.04	0.00	0.2767	0.7233	0.0032
610.75	1.04	0.00	0.2774	0.7226	0.0032
610.74	1.03	0.00	0.2782	0.7218	0.0032
610.73	1.03	0.00	0.2790	0.7210	0.0032
610.72	1.03	0.00	0.2797	0.7203	0.0031
610.71	1.03	0.00	0.2805	0.7195	0.0031
610.70	1.02	0.00	0.2813	0.7187	0.0031
610.69	1.02	0.00	0.2820	0.7180	0.0031
610.68	1.02	0.00	0.2828	0.7172	0.0031
610.67	1.02	0.00	0.2836	0.7164	0.0031
610.66	1.02	0.00	0.2844	0.7156	0.0031
610.65	1.01	0.00	0.2852	0.7148	0.0031
610.64	1.01	0.00	0.2860	0.7140	0.0031
610.63	1.01	0.00	0.2868	0.7132	0.0031
610.62	1.01	0.00	0.2876	0.7124	0.0031
610.61	1.00	0.00	0.2885	0.7115	0.0031
610.60	1.00	0.00	0.2893	0.7107	0.0031
610.59	1.00	0.00	0.2901	0.7099	0.0031
610.58	1.00	0.00	0.2909	0.7091	0.0031
610.57	1.00	0.00	0.2918	0.7082	0.0031
610.56	0.99	0.00	0.2926	0.7074	0.0031
610.55	0.99	0.00	0.2935	0.7065	0.0031
610.54	0.99	0.00	0.2943	0.7057	0.0031
610.53	0.99	0.00	0.2952	0.7048	0.0031
610.52	0.98	0.00	0.2960	0.7040	0.0031
610.51	0.98	0.00	0.2969	0.7031	0.0031
610.50	0.98	0.00	0.2978	0.7022	0.0031
610.49	0.98	0.00	0.2987	0.7013	0.0031
610.48	0.97	0.00	0.2995	0.7005	0.0031
610.47	0.97	0.00	0.3004	0.6996	0.0031
610.46	0.97	0.00	0.3013	0.6987	0.0031
610.45	0.97	0.00	0.3022	0.6978	0.0030
610.44	0.97	0.00	0.3031	0.6969	0.0030
610.43	0.96	0.00	0.3041	0.6959	0.0030
610.42	0.96	0.00	0.3050	0.6950	0.0030
610.41	0.96	0.00	0.3059	0.6941	0.0030
610.40	0.96	0.00	0.3068	0.6932	0.0030
610.39	0.95	0.00	0.3078	0.6922	0.0030
610.38	0.95	0.00	0.3087	0.6913	0.0030
610.37	0.95	0.00	0.3096	0.6904	0.0030
610.36	0.95	0.00	0.3106	0.6894	0.0030
610.35	0.94	0.00	0.3116	0.6884	0.0030
610.34	0.94	0.00	0.3125	0.6875	0.0030
610.33	0.94	0.00	0.3135	0.6865	0.0030
610.32	0.94	0.00	0.3145	0.6855	0.0030
610.31	0.94	0.00	0.3154	0.6846	0.0030
610.30	0.93	0.00	0.3164	0.6836	0.0030
610.29	0.93	0.00	0.3174	0.6826	0.0030
610.28	0.93	0.00	0.3184	0.6816	0.0030
610.27	0.93	0.00	0.3194	0.6806	0.0030
610.26	0.92	0.00	0.3204	0.6796	0.0030
610.25	0.92	0.00	0.3215	0.6785	0.0030
610.24	0.92	0.00	0.3225	0.6775	0.0030
610.23	0.92	0.00	0.3235	0.6765	0.0030
610.22	0.92	0.00	0.3246	0.6754	0.0030
610.21	0.91	0.00	0.3256	0.6744	0.0029
610.20	0.91	0.00	0.3266	0.6734	0.0029
610.19	0.91	0.00	0.3277	0.6723	0.0029
610.18	0.91	0.00	0.3288	0.6712	0.0029
610.17	0.90	0.00	0.3298	0.6702	0.0029
610.16	0.90	0.00	0.3309	0.6691	0.0029
610.15	0.90	0.00	0.3320	0.6680	0.0029
610.14	0.90	0.00	0.3331	0.6669	0.0029
610.13	0.89	0.00	0.3342	0.6658	0.0029
610.12	0.89	0.00	0.3353	0.6647	0.0029
610.11	0.89	0.00	0.3364	0.6636	0.0029
610.10	0.89	0.00	0.3375	0.6625	0.0029
610.09	0.89	0.00	0.3386	0.6614	0.0029
610.08	0.88	0.00	0.3398	0.6602	0.0029
610.07	0.88	0.00	0.3409	0.6591	0.0029
610.06	0.88	0.00	0.3421	0.6579	0.0029
610.05	0.88	0.00	0.3432	0.6568	0.0029

610.04	0.87	0.00	0.3444	0.6556	0.0029
610.03	0.87	0.00	0.3455	0.6545	0.0029
610.02	0.87	0.00	0.3467	0.6533	0.0029
610.01	0.87	0.00	0.3479	0.6521	0.0028
610.00	0.87	0.00	0.3491	0.6509	0.0028
609.99	0.86	0.00	0.3503	0.6497	0.0028
609.98	0.86	0.00	0.3515	0.6485	0.0028
609.97	0.86	0.00	0.3527	0.6473	0.0028
609.96	0.86	0.00	0.3539	0.6461	0.0028
609.95	0.85	0.00	0.3552	0.6448	0.0028
609.94	0.85	0.00	0.3564	0.6436	0.0028
609.93	0.85	0.00	0.3576	0.6424	0.0028
609.92	0.85	0.00	0.3589	0.6411	0.0028
609.91	0.84	0.00	0.3601	0.6399	0.0028
609.90	0.84	0.00	0.3614	0.6386	0.0028
609.89	0.84	0.00	0.3627	0.6373	0.0028
609.88	0.84	0.00	0.3640	0.6360	0.0028
609.87	0.84	0.00	0.3653	0.6347	0.0028
609.86	0.83	0.00	0.3666	0.6334	0.0028
609.85	0.83	0.00	0.3679	0.6321	0.0028
609.84	0.83	0.00	0.3692	0.6308	0.0028
609.83	0.83	0.00	0.3705	0.6295	0.0028
609.82	0.82	0.00	0.3718	0.6282	0.0027
609.81	0.82	0.00	0.3732	0.6268	0.0027
609.80	0.82	0.00	0.3745	0.6255	0.0027
609.79	0.82	0.00	0.3759	0.6241	0.0027
609.78	0.81	0.00	0.3772	0.6228	0.0027
609.77	0.81	0.00	0.3786	0.6214	0.0027
609.76	0.81	0.00	0.3800	0.6200	0.0027
609.75	0.81	0.00	0.3814	0.6186	0.0027
609.74	0.81	0.00	0.3828	0.6172	0.0027
609.73	0.80	0.00	0.3842	0.6158	0.0027
609.72	0.80	0.00	0.3856	0.6144	0.0027
609.71	0.80	0.00	0.3870	0.6130	0.0027
609.70	0.80	0.00	0.3885	0.6115	0.0027
609.69	0.79	0.00	0.3899	0.6101	0.0027
609.68	0.79	0.00	0.3914	0.6086	0.0027
609.67	0.79	0.00	0.3928	0.6072	0.0027
609.66	0.79	0.00	0.3943	0.6057	0.0026
609.65	0.79	0.00	0.3958	0.6042	0.0026
609.64	0.78	0.00	0.3973	0.6027	0.0026
609.63	0.78	0.00	0.3988	0.6012	0.0026
609.62	0.78	0.00	0.4003	0.5997	0.0026
609.61	0.78	0.00	0.4018	0.5982	0.0026
609.60	0.77	0.00	0.4033	0.5967	0.0026
609.59	0.77	0.00	0.4049	0.5951	0.0026
609.58	0.77	0.00	0.4064	0.5936	0.0026
609.57	0.77	0.00	0.4080	0.5920	0.0026
609.56	0.76	0.00	0.4095	0.5905	0.0026
609.55	0.76	0.00	0.4111	0.5889	0.0026
609.54	0.76	0.00	0.4127	0.5873	0.0026
609.53	0.76	0.00	0.4143	0.5857	0.0026
609.52	0.76	0.00	0.4159	0.5841	0.0026
609.51	0.75	0.00	0.4175	0.5825	0.0025
609.50	0.75	0.00	0.4191	0.5809	0.0025
609.49	0.75	0.00	0.4208	0.5792	0.0025
609.48	0.75	0.00	0.4224	0.5776	0.0025
609.47	0.74	0.00	0.4241	0.5759	0.0025
609.46	0.74	0.00	0.4257	0.5743	0.0025
609.45	0.74	0.00	0.4274	0.5726	0.0025
609.44	0.74	0.00	0.4291	0.5709	0.0025
609.43	0.74	0.00	0.4308	0.5692	0.0025
609.42	0.73	0.00	0.4325	0.5675	0.0025
609.41	0.73	0.00	0.4342	0.5658	0.0025
609.40	0.73	0.00	0.4359	0.5641	0.0025
609.39	0.73	0.00	0.4376	0.5624	0.0025
609.38	0.72	0.00	0.4394	0.5606	0.0024
609.37	0.72	0.00	0.4411	0.5589	0.0024
609.36	0.72	0.00	0.4429	0.5571	0.0024
609.35	0.72	0.00	0.4447	0.5553	0.0024
609.34	0.71	0.00	0.4465	0.5535	0.0024
609.33	0.71	0.00	0.4483	0.5517	0.0024
609.32	0.71	0.00	0.4501	0.5499	0.0024
609.31	0.71	0.00	0.4519	0.5481	0.0024
609.30	0.71	0.00	0.4537	0.5463	0.0024
609.29	0.70	0.00	0.4556	0.5444	0.0024
609.28	0.70	0.00	0.4574	0.5426	0.0024
609.27	0.70	0.00	0.4593	0.5407	0.0024
609.26	0.70	0.00	0.4612	0.5388	0.0024

609.25	0.69	0.00	0.4631	0.5369	0.0023
609.24	0.69	0.00	0.4650	0.5350	0.0023
609.23	0.69	0.00	0.4669	0.5331	0.0023
609.22	0.69	0.00	0.4688	0.5312	0.0023
609.21	0.68	0.00	0.4707	0.5293	0.0023
609.20	0.68	0.00	0.4727	0.5273	0.0023
609.19	0.68	0.00	0.4746	0.5254	0.0023
609.18	0.68	0.00	0.4766	0.5234	0.0023
609.17	0.68	0.00	0.4785	0.5215	0.0023
609.16	0.67	0.00	0.4805	0.5195	0.0023
609.15	0.67	0.00	0.4825	0.5175	0.0023
609.14	0.67	0.00	0.4845	0.5155	0.0023
609.13	0.67	0.00	0.4866	0.5134	0.0022
609.12	0.66	0.00	0.4886	0.5114	0.0022
609.11	0.66	0.00	0.4906	0.5094	0.0022
609.10	0.66	0.00	0.4927	0.5073	0.0022
609.09	0.66	0.00	0.4947	0.5053	0.0022
609.08	0.66	0.00	0.4968	0.5032	0.0022
609.07	0.65	0.00	0.4989	0.5011	0.0022
609.06	0.65	0.00	0.5010	0.4990	0.0022
609.05	0.65	0.00	0.5031	0.4969	0.0022
609.04	0.65	0.00	0.5052	0.4948	0.0022
609.03	0.64	0.00	0.5074	0.4926	0.0022
609.02	0.64	0.00	0.5095	0.4905	0.0021
609.01	0.64	0.00	0.5117	0.4883	0.0021
609.00	0.64	0.00	0.5138	0.4862	0.0021
608.99	0.63	0.00	0.5160	0.4840	0.0021
608.98	0.63	0.00	0.5182	0.4818	0.0021
608.97	0.63	0.00	0.5204	0.4796	0.0021
608.96	0.63	0.00	0.5226	0.4774	0.0021
608.95	0.63	0.00	0.5248	0.4752	0.0021
608.94	0.62	0.00	0.5271	0.4729	0.0021
608.93	0.62	0.00	0.5293	0.4707	0.0021
608.92	0.62	0.00	0.5316	0.4684	0.0020
608.91	0.62	0.00	0.5339	0.4661	0.0020
608.90	0.61	0.00	0.5361	0.4639	0.0020
608.89	0.61	0.00	0.5384	0.4616	0.0020
608.88	0.61	0.00	0.5407	0.4593	0.0020
608.87	0.61	0.00	0.5430	0.4570	0.0020
608.86	0.61	0.00	0.5454	0.4546	0.0020
608.85	0.60	0.00	0.5477	0.4523	0.0020
608.84	0.60	0.00	0.5501	0.4499	0.0020
608.83	0.60	0.00	0.5524	0.4476	0.0020
608.82	0.60	0.00	0.5548	0.4452	0.0019
608.81	0.59	0.00	0.5572	0.4428	0.0019
608.80	0.59	0.00	0.5596	0.4404	0.0019
608.79	0.59	0.00	0.5620	0.4380	0.0019
608.78	0.59	0.00	0.5644	0.4356	0.0019
608.77	0.58	0.00	0.5668	0.4332	0.0019
608.76	0.58	0.00	0.5692	0.4308	0.0019
608.75	0.58	0.00	0.5717	0.4283	0.0019
608.74	0.58	0.00	0.5741	0.4259	0.0019
608.73	0.58	0.00	0.5766	0.4234	0.0019
608.72	0.57	0.00	0.5791	0.4209	0.0018
608.71	0.57	0.00	0.5816	0.4184	0.0018
608.70	0.57	0.00	0.5841	0.4159	0.0018
608.69	0.57	0.00	0.5866	0.4134	0.0018
608.68	0.56	0.00	0.5891	0.4109	0.0018
608.67	0.56	0.00	0.5916	0.4084	0.0018
608.66	0.56	0.00	0.5942	0.4058	0.0018
608.65	0.56	0.00	0.5967	0.4033	0.0018
608.64	0.55	0.00	0.5993	0.4007	0.0018
608.63	0.55	0.00	0.6018	0.3982	0.0017
608.62	0.55	0.00	0.6044	0.3956	0.0017
608.61	0.55	0.00	0.6070	0.3930	0.0017
608.60	0.55	0.00	0.6096	0.3904	0.0017
608.59	0.54	0.00	0.6122	0.3878	0.0017
608.58	0.54	0.00	0.6148	0.3852	0.0017
608.57	0.54	0.00	0.6175	0.3825	0.0017
608.56	0.54	0.00	0.6201	0.3799	0.0017
608.55	0.53	0.00	0.6227	0.3773	0.0016
608.54	0.53	0.00	0.6254	0.3746	0.0016
608.53	0.53	0.00	0.6280	0.3720	0.0016
608.52	0.53	0.00	0.6307	0.3693	0.0016
608.51	0.53	0.00	0.6334	0.3666	0.0016
608.50	0.52	0.00	0.6361	0.3639	0.0016
608.49	0.52	0.00	0.6388	0.3612	0.0016
608.48	0.52	0.00	0.6415	0.3585	0.0016
608.47	0.52	0.00	0.6442	0.3558	0.0016

608.46	0.51	0.00	0.6469	0.3531	0.0015
608.45	0.51	0.00	0.6496	0.3504	0.0015
608.44	0.51	0.00	0.6523	0.3477	0.0015
608.43	0.51	0.00	0.6551	0.3449	0.0015
608.42	0.50	0.00	0.6578	0.3422	0.0015
608.41	0.50	0.00	0.6606	0.3394	0.0015
608.40	0.50	0.00	0.6633	0.3367	0.0015
608.39	0.50	0.00	0.6661	0.3339	0.0015
608.38	0.50	0.00	0.6689	0.3311	0.0014
608.37	0.49	0.00	0.6716	0.3284	0.0014
608.36	0.49	0.00	0.6744	0.3256	0.0014
608.35	0.49	0.00	0.6772	0.3228	0.0014
608.34	0.49	0.00	0.6800	0.3200	0.0014
608.33	0.48	0.00	0.6828	0.3172	0.0014
608.32	0.48	0.00	0.6856	0.3144	0.0014
608.31	0.48	0.00	0.6884	0.3116	0.0014
608.30	0.48	0.00	0.6912	0.3088	0.0013
608.29	0.48	0.00	0.6940	0.3060	0.0013
608.28	0.47	0.00	0.6968	0.3032	0.0013
608.27	0.47	0.00	0.6996	0.3004	0.0013
608.26	0.47	0.00	0.7024	0.2976	0.0013
608.25	0.47	0.00	0.7053	0.2947	0.0013
608.24	0.46	0.00	0.7081	0.2919	0.0013
608.23	0.46	0.00	0.7109	0.2891	0.0013
608.22	0.46	0.00	0.7138	0.2862	0.0013
608.21	0.46	0.00	0.7166	0.2834	0.0012
608.20	0.45	0.00	0.7194	0.2806	0.0012
608.19	0.45	0.00	0.7223	0.2777	0.0012
608.18	0.45	0.00	0.7251	0.2749	0.0012
608.17	0.45	0.00	0.7279	0.2721	0.0012
608.16	0.45	0.00	0.7308	0.2692	0.0012
608.15	0.44	0.00	0.7336	0.2664	0.0012
608.14	0.44	0.00	0.7364	0.2636	0.0012
608.13	0.44	0.00	0.7393	0.2607	0.0011
608.12	0.44	0.00	0.7421	0.2579	0.0011
608.11	0.43	0.00	0.7449	0.2551	0.0011
608.10	0.43	0.00	0.7478	0.2522	0.0011
608.09	0.43	0.00	0.7506	0.2494	0.0011
608.08	0.43	0.00	0.7534	0.2466	0.0011
608.07	0.43	0.00	0.7563	0.2437	0.0011
608.06	0.42	0.00	0.7591	0.2409	0.0011
608.05	0.42	0.00	0.7619	0.2381	0.0010
608.04	0.42	0.00	0.7647	0.2353	0.0010
608.03	0.42	0.00	0.7675	0.2325	0.0010
608.02	0.41	0.00	0.7703	0.2297	0.0010
608.01	0.41	0.00	0.7731	0.2269	0.0010
608.00	0.41	0.00	0.7759	0.2241	0.0010
607.99	0.41	0.00	0.7787	0.2213	0.0010
607.98	0.40	0.00	0.7815	0.2185	0.0010
607.97	0.40	0.00	0.7843	0.2157	0.0009
607.96	0.40	0.00	0.7871	0.2129	0.0009
607.95	0.40	0.00	0.7898	0.2102	0.0009
607.94	0.40	0.00	0.7926	0.2074	0.0009
607.93	0.39	0.00	0.7954	0.2046	0.0009
607.92	0.39	0.00	0.7981	0.2019	0.0009
607.91	0.39	0.00	0.8008	0.1992	0.0009
607.90	0.39	0.00	0.8036	0.1964	0.0009
607.89	0.38	0.00	0.8063	0.1937	0.0008
607.88	0.38	0.00	0.8090	0.1910	0.0008
607.87	0.38	0.00	0.8117	0.1883	0.0008
607.86	0.38	0.00	0.8144	0.1856	0.0008
607.85	0.37	0.00	0.8171	0.1829	0.0008
607.84	0.37	0.00	0.8197	0.1803	0.0008
607.83	0.37	0.00	0.8224	0.1776	0.0008
607.82	0.37	0.00	0.8251	0.1749	0.0008
607.81	0.37	0.00	0.8277	0.1723	0.0008
607.80	0.36	0.00	0.8303	0.1697	0.0007
607.79	0.36	0.00	0.8329	0.1671	0.0007
607.78	0.36	0.00	0.8355	0.1645	0.0007
607.77	0.36	0.00	0.8381	0.1619	0.0007
607.76	0.35	0.00	0.8407	0.1593	0.0007
607.75	0.35	0.00	0.8432	0.1568	0.0007
607.74	0.35	0.00	0.8458	0.1542	0.0007
607.73	0.35	0.00	0.8483	0.1517	0.0007
607.72	0.35	0.00	0.8508	0.1492	0.0007
607.71	0.34	0.00	0.8533	0.1467	0.0006
607.70	0.34	0.00	0.8558	0.1442	0.0006
607.69	0.34	0.00	0.8583	0.1417	0.0006
607.68	0.34	0.00	0.8607	0.1393	0.0006



607.67	0.33	0.00	0.8631	0.1369	0.0006
607.66	0.33	0.00	0.8656	0.1344	0.0006
607.65	0.33	0.00	0.8680	0.1320	0.0006
607.64	0.33	0.00	0.8703	0.1297	0.0006
607.63	0.32	0.00	0.8727	0.1273	0.0006
607.62	0.32	0.00	0.8751	0.1249	0.0005
607.61	0.32	0.00	0.8774	0.1226	0.0005
607.60	0.32	0.00	0.8797	0.1203	0.0005
607.59	0.32	0.00	0.8820	0.1180	0.0005
607.58	0.31	0.00	0.8842	0.1158	0.0005
607.57	0.31	0.00	0.8865	0.1135	0.0005
607.56	0.31	0.00	0.8887	0.1113	0.0005
607.55	0.31	0.00	0.8909	0.1091	0.0005
607.54	0.30	0.00	0.8931	0.1069	0.0005
607.53	0.30	0.00	0.8953	0.1047	0.0005
607.52	0.30	0.00	0.8974	0.1026	0.0004
607.51	0.30	0.00	0.8996	0.1004	0.0004
607.50	0.30	0.00	0.9017	0.0983	0.0004
607.49	0.29	0.00	0.9037	0.0963	0.0004
607.48	0.29	0.00	0.9058	0.0942	0.0004
607.47	0.29	0.00	0.9078	0.0922	0.0004
607.46	0.29	0.00	0.9099	0.0901	0.0004
607.45	0.28	0.00	0.9119	0.0881	0.0004
607.44	0.28	0.00	0.9138	0.0862	0.0004
607.43	0.28	0.00	0.9158	0.0842	0.0004
607.42	0.28	0.00	0.9177	0.0823	0.0004
607.41	0.27	0.00	0.9196	0.0804	0.0004
607.40	0.27	0.00	0.9215	0.0785	0.0003
607.39	0.27	0.00	0.9233	0.0767	0.0003
607.38	0.27	0.00	0.9252	0.0748	0.0003
607.37	0.27	0.00	0.9270	0.0730	0.0003
607.36	0.26	0.00	0.9288	0.0712	0.0003
607.35	0.26	0.00	0.9305	0.0695	0.0003
607.34	0.26	0.00	0.9323	0.0677	0.0003
607.33	0.26	0.00	0.9340	0.0660	0.0003
607.32	0.25	0.00	0.9357	0.0643	0.0003
607.31	0.25	0.00	0.9373	0.0627	0.0003
607.30	0.25	0.00	0.9390	0.0610	0.0003
607.29	0.25	0.00	0.9406	0.0594	0.0003
607.28	0.24	0.00	0.9422	0.0578	0.0003
607.27	0.24	0.00	0.9437	0.0563	0.0002
607.26	0.24	0.00	0.9453	0.0547	0.0002
607.25	0.24	0.00	0.9468	0.0532	0.0002
607.24	0.24	0.00	0.9483	0.0517	0.0002
607.23	0.23	0.00	0.9497	0.0503	0.0002
607.22	0.23	0.00	0.9512	0.0488	0.0002
607.21	0.23	0.00	0.9526	0.0474	0.0002
607.20	0.23	0.00	0.9540	0.0460	0.0002
607.19	0.22	0.00	0.9553	0.0447	0.0002
607.18	0.22	0.00	0.9567	0.0433	0.0002
607.17	0.22	0.00	0.9580	0.0420	0.0002
607.16	0.22	0.00	0.9593	0.0407	0.0002
607.15	0.22	0.00	0.9606	0.0394	0.0002
607.14	0.21	0.00	0.9618	0.0382	0.0002
607.13	0.21	0.00	0.9630	0.0370	0.0002
607.12	0.21	0.00	0.9642	0.0358	0.0002
607.11	0.21	0.00	0.9654	0.0346	0.0002
607.10	0.20	0.00	0.9665	0.0335	0.0001
607.09	0.20	0.00	0.9677	0.0323	0.0001
607.08	0.20	0.00	0.9688	0.0312	0.0001
607.07	0.20	0.00	0.9698	0.0302	0.0001
607.06	0.19	0.00	0.9709	0.0291	0.0001
607.05	0.19	0.00	0.9719	0.0281	0.0001
607.04	0.19	0.00	0.9729	0.0271	0.0001
607.03	0.19	0.00	0.9739	0.0261	0.0001
607.02	0.19	0.00	0.9749	0.0251	0.0001
607.01	0.18	0.00	0.9758	0.0242	0.0001
607.00	0.18	0.00	0.9767	0.0233	0.0001
606.99	0.18	0.00	0.9776	0.0224	0.0001
606.98	0.18	0.00	0.9785	0.0215	0.0001
606.97	0.17	0.00	0.9793	0.0207	0.0001
606.96	0.17	0.00	0.9801	0.0199	0.0001
606.95	0.17	0.00	0.9809	0.0191	0.0001
606.94	0.17	0.00	0.9817	0.0183	0.0001
606.93	0.17	0.00	0.9825	0.0175	0.0001
606.92	0.16	0.00	0.9832	0.0168	0.0001
606.91	0.16	0.00	0.9839	0.0161	0.0001
606.90	0.16	0.00	0.9846	0.0154	0.0001
606.89	0.16	0.00	0.9853	0.0147	0.0001

606.88	0.15	0.00	0.9860	0.0140	0.0001
606.87	0.15	0.00	0.9866	0.0134	0.0001
606.86	0.15	0.00	0.9872	0.0128	0.0001
606.85	0.15	0.00	0.9878	0.0122	0.0001
606.84	0.14	0.00	0.9884	0.0116	0.0001
606.83	0.14	0.00	0.9890	0.0110	0.0000
606.82	0.14	0.00	0.9895	0.0105	0.0000
606.81	0.14	0.00	0.9900	0.0100	0.0000
606.80	0.14	0.00	0.9906	0.0094	0.0000
606.79	0.13	0.00	0.9910	0.0090	0.0000
606.78	0.13	0.00	0.9915	0.0085	0.0000
606.77	0.13	0.00	0.9920	0.0080	0.0000
606.76	0.13	0.00	0.9924	0.0076	0.0000
606.75	0.12	0.00	0.9928	0.0072	0.0000
606.74	0.12	0.00	0.9932	0.0068	0.0000
606.73	0.12	0.00	0.9936	0.0064	0.0000
606.72	0.12	0.00	0.9940	0.0060	0.0000
606.71	0.11	0.00	0.9944	0.0056	0.0000
606.70	0.11	0.00	0.9947	0.0053	0.0000
606.69	0.11	0.00	0.9950	0.0050	0.0000
606.68	0.11	0.00	0.9954	0.0046	0.0000
606.67	0.11	0.00	0.9957	0.0043	0.0000
606.66	0.10	0.00	0.9959	0.0041	0.0000
606.65	0.10	0.00	0.9962	0.0038	0.0000
606.64	0.10	0.00	0.9965	0.0035	0.0000
606.63	0.10	0.00	0.9967	0.0033	0.0000
606.62	0.09	0.00	0.9970	0.0030	0.0000
606.61	0.09	0.00	0.9972	0.0028	0.0000
606.60	0.09	0.00	0.9974	0.0026	0.0000
606.59	0.09	0.00	0.9976	0.0024	0.0000
606.58	0.09	0.00	0.9978	0.0022	0.0000
606.57	0.08	0.00	0.9980	0.0020	0.0000
606.56	0.08	0.00	0.9982	0.0018	0.0000
606.55	0.08	0.00	0.9983	0.0017	0.0000
606.54	0.08	0.00	0.9985	0.0015	0.0000
606.53	0.07	0.00	0.9986	0.0014	0.0000
606.52	0.07	0.00	0.9987	0.0013	0.0000
606.51	0.07	0.00	0.9989	0.0011	0.0000
606.50	0.07	0.00	0.9990	0.0010	0.0000
606.49	0.06	0.00	0.9991	0.0009	0.0000
606.48	0.06	0.00	0.9992	0.0008	0.0000
606.47	0.06	0.00	0.9993	0.0007	0.0000
606.46	0.06	0.00	0.9994	0.0006	0.0000
606.45	0.06	0.00	0.9994	0.0006	0.0000
606.44	0.05	0.00	0.9995	0.0005	0.0000
606.43	0.05	0.00	0.9996	0.0004	0.0000
606.42	0.05	0.00	0.9996	0.0004	0.0000
606.41	0.05	0.00	0.9997	0.0003	0.0000
606.40	0.04	0.00	0.9997	0.0003	0.0000
606.39	0.04	0.00	0.9998	0.0002	0.0000
606.38	0.04	0.00	0.9998	0.0002	0.0000
606.37	0.04	0.00	0.9998	0.0002	0.0000
606.36	0.04	0.00	0.9999	0.0001	0.0000
606.35	0.03	0.00	0.9999	0.0001	0.0000
606.34	0.03	0.00	0.9999	0.0001	0.0000
606.33	0.03	0.00	0.9999	0.0001	0.0000
606.32	0.03	0.00	0.9999	0.0001	0.0000
606.31	0.02	0.00	1.0000	0.0000	0.0000
606.30	0.02	0.00	1.0000	0.0000	0.0000
606.29	0.02	0.00	1.0000	0.0000	0.0000
606.28	0.02	0.00	1.0000	0.0000	0.0000
606.27	0.01	0.00	1.0000	0.0000	0.0000
606.26	0.01	0.00	1.0000	0.0000	0.0000
606.25	0.01	0.00	1.0000	0.0000	0.0000
606.24	0.01	0.00	1.0000	0.0000	0.0000
606.23	0.01	0.00	1.0000	0.0000	0.0000
606.22	0.00	0.00	1.0000	0.0000	0.0000
606.21	0.00	0.00	1.0000	0.0000	0.0000
Zow = 606.21	0.00	0.00	1.0000	0.0000	0.0000

Oil Specific Volume 2.7860 ft<sup>3</sup>/ft<sup>2</sup>

Average 0.4826  
Maximum 0.8595

Data Entry Worksheet for Soil Samples -- Oil Specific Volume (OSV) Calculations

Project No. = 406   = User must enter the soil or fluid parameter, or lab data, as appropriate  
Boring Designation = MW-22

Soil Parameters

Fluid Parameters

Oil Parameters

Required to Estimate OSV - Soil

Required to Estimate OSV - Soil

$\rho_b$  = 1.6 g/cm<sup>3</sup> Bulk density of soil

$\rho_o$  = 0.7903 g/cm<sup>3</sup> Oil density

Soil Sample Data

Sample Intervals (maximum 21 samples)

	Feet (bgs)	to	Feet (bgs)	GRO or DRO (mg/kg)
1	<span style="background-color: #d4edda;"> </span>		<span style="background-color: #d4edda;"> </span>	<span style="background-color: #d4edda;"> </span>
2	<span style="background-color: #d4edda;"> </span>		<span style="background-color: #d4edda;"> </span>	<span style="background-color: #d4edda;"> </span>
3	<span style="background-color: #d4edda;"> </span>		<span style="background-color: #d4edda;"> </span>	<span style="background-color: #d4edda;"> </span>
4	<span style="background-color: #d4edda;"> </span>		<span style="background-color: #d4edda;"> </span>	<span style="background-color: #d4edda;"> </span>
5	<span style="background-color: #d4edda;"> </span>		<span style="background-color: #d4edda;"> </span>	<span style="background-color: #d4edda;"> </span>
6	<span style="background-color: #d4edda;"> </span>		<span style="background-color: #d4edda;"> </span>	<span style="background-color: #d4edda;"> </span>
7	<span style="background-color: #d4edda;"> </span>		<span style="background-color: #d4edda;"> </span>	<span style="background-color: #d4edda;"> </span>
8	<span style="background-color: #d4edda;"> </span>		<span style="background-color: #d4edda;"> </span>	<span style="background-color: #d4edda;"> </span>
9	<span style="background-color: #d4edda;"> </span>		<span style="background-color: #d4edda;"> </span>	<span style="background-color: #d4edda;"> </span>
10	<span style="background-color: #d4edda;"> </span>		<span style="background-color: #d4edda;"> </span>	<span style="background-color: #d4edda;"> </span>
11	<span style="background-color: #d4edda;"> </span>		<span style="background-color: #d4edda;"> </span>	<span style="background-color: #d4edda;"> </span>
12	<span style="background-color: #d4edda;"> </span>		<span style="background-color: #d4edda;"> </span>	<span style="background-color: #d4edda;"> </span>
13	<span style="background-color: #d4edda;"> </span>		<span style="background-color: #d4edda;"> </span>	<span style="background-color: #d4edda;"> </span>
14	<span style="background-color: #d4edda;"> </span>		<span style="background-color: #d4edda;"> </span>	<span style="background-color: #d4edda;"> </span>
15	<span style="background-color: #d4edda;"> </span>		<span style="background-color: #d4edda;"> </span>	<span style="background-color: #d4edda;"> </span>
16	<span style="background-color: #d4edda;"> </span>		<span style="background-color: #d4edda;"> </span>	<span style="background-color: #d4edda;"> </span>
17	<span style="background-color: #d4edda;"> </span>		<span style="background-color: #d4edda;"> </span>	<span style="background-color: #d4edda;"> </span>
18	<span style="background-color: #d4edda;"> </span>		<span style="background-color: #d4edda;"> </span>	<span style="background-color: #d4edda;"> </span>
19	<span style="background-color: #d4edda;"> </span>		<span style="background-color: #d4edda;"> </span>	<span style="background-color: #d4edda;"> </span>
20	<span style="background-color: #d4edda;"> </span>		<span style="background-color: #d4edda;"> </span>	<span style="background-color: #d4edda;"> </span>
21	<span style="background-color: #d4edda;"> </span>		<span style="background-color: #d4edda;"> </span>	<span style="background-color: #d4edda;"> </span>

Deepest sample must be entered in this row

Data Entry Worksheet for Monitoring Well Fluid Data -- Oil Specific Volume (OSV) Calculations

Project No. = 406  
Boring Designation = MW-22

[ ] = User must enter the soil or fluid parameter, or lab data, as appropriate

Soil Parameters

Required to Estimate OSV - MWs

$\phi$  = 0.437 Total porosity  
 $\sigma_{ow}$  = 18.2 dynes/cm Oil/Water Interfacial Tension  
 $\sigma_{ao}$  = 22.7 dynes/cm Air/Oil Surface Tension  
 $\sigma_{aw}$  = 62.1 dynes/cm Air/Water Surface Tension  
 $\alpha$  = 0.125 /foot Van Genuchten mean pore-size parameter  
 $n$  = 3.00500 Van Genuchten pore-size distribution exponent  
 $S_m$  = 0.046 Irreducible water saturation

Fluid Parameters

$\rho_{ro}$  = 0.7903 Ratio of oil to water density  
 $\beta_{ao}$  = 2.74 Ratio of water surface tension to oil surface tension  
 $\beta_{ow}$  = 3.41 Ratio of water surface tension to oil-water interfacial tension  
 $Z_{ow}$  = 19.54 feet Depth to oil/air interface  
 $Z_{ao}$  = 22.32 feet Depth to oil/water interface  
 $S_m$  = 0.046 Water saturation at field capacity  
 $\alpha$  = 0.125 /foot Van Genuchten mean pore-size parameter  
 $n$  = 3.00500 Van Genuchten pore-size distribution exponent  
 $m$  = 0.334443 Calculated from "n" (Burdine)  
 $dZ$  = 0.01 feet Integration increment (0.01 to 1.0)  
TOC = 639.1 feet Elevation of TOC or measuring point



Oil Specific Volume Calculation Spreadsheet for Free-phase Hydrocarbon in Monitoring Wells

Project No. 406  
 Boring Designation MW-22

**DO NOT CHANGE ANY CELLS ON THIS WORKSHEET**

Z (feet)	$h_{ow}$ (feet)	$h_{ao}$ (feet)	$S_w$ (-)	$S_{of}$ (-)	$\phi S_{of} dZ$ (ft <sup>3</sup> /ft <sup>2</sup> )
Z <sub>u</sub> = 620.94	0.87	1.09	0.9688	0.0000	0.0000
620.93	0.87	1.08	0.9690	0.0004	0.0000
620.92	0.87	1.07	0.9692	0.0009	0.0000
620.91	0.87	1.06	0.9695	0.0013	0.0000
620.90	0.86	1.06	0.9697	0.0017	0.0000
620.89	0.86	1.05	0.9699	0.0021	0.0000
620.88	0.86	1.04	0.9701	0.0025	0.0000
620.87	0.86	1.03	0.9703	0.0029	0.0000
620.86	0.85	1.02	0.9705	0.0033	0.0000
620.85	0.85	1.02	0.9707	0.0036	0.0000
620.84	0.85	1.01	0.9709	0.0040	0.0000
620.83	0.85	1.00	0.9711	0.0044	0.0000
620.82	0.85	0.99	0.9713	0.0047	0.0000
620.81	0.84	0.98	0.9716	0.0051	0.0000
620.80	0.84	0.98	0.9718	0.0054	0.0000
620.79	0.84	0.97	0.9720	0.0057	0.0000
620.78	0.84	0.96	0.9722	0.0061	0.0000
620.77	0.84	0.95	0.9724	0.0064	0.0000
620.76	0.83	0.94	0.9726	0.0067	0.0000
620.75	0.83	0.94	0.9728	0.0070	0.0000
620.74	0.83	0.93	0.9730	0.0073	0.0000
620.73	0.83	0.92	0.9732	0.0076	0.0000
620.72	0.83	0.91	0.9734	0.0079	0.0000
620.71	0.82	0.91	0.9736	0.0081	0.0000
620.70	0.82	0.90	0.9737	0.0084	0.0000
620.69	0.82	0.89	0.9739	0.0087	0.0000
620.68	0.82	0.88	0.9741	0.0089	0.0000
620.67	0.81	0.87	0.9743	0.0092	0.0000
620.66	0.81	0.87	0.9745	0.0094	0.0000
620.65	0.81	0.86	0.9747	0.0097	0.0000
620.64	0.81	0.85	0.9749	0.0099	0.0000
620.63	0.81	0.84	0.9751	0.0101	0.0000
620.62	0.80	0.83	0.9753	0.0103	0.0000
620.61	0.80	0.83	0.9755	0.0105	0.0000
620.60	0.80	0.82	0.9756	0.0108	0.0000
620.59	0.80	0.81	0.9758	0.0110	0.0000
620.58	0.80	0.80	0.9760	0.0111	0.0000
620.57	0.79	0.79	0.9762	0.0113	0.0000
620.56	0.79	0.79	0.9764	0.0115	0.0001
620.55	0.79	0.78	0.9766	0.0117	0.0001
620.54	0.79	0.77	0.9767	0.0119	0.0001
620.53	0.79	0.76	0.9769	0.0120	0.0001
620.52	0.78	0.75	0.9771	0.0122	0.0001
620.51	0.78	0.75	0.9773	0.0123	0.0001
620.50	0.78	0.74	0.9775	0.0125	0.0001
620.49	0.78	0.73	0.9776	0.0126	0.0001
620.48	0.77	0.72	0.9778	0.0127	0.0001
620.47	0.77	0.72	0.9780	0.0129	0.0001
620.46	0.77	0.71	0.9782	0.0130	0.0001
620.45	0.77	0.70	0.9783	0.0131	0.0001
620.44	0.77	0.69	0.9785	0.0132	0.0001
620.43	0.76	0.68	0.9787	0.0133	0.0001
620.42	0.76	0.68	0.9788	0.0134	0.0001
620.41	0.76	0.67	0.9790	0.0135	0.0001
620.40	0.76	0.66	0.9792	0.0136	0.0001
620.39	0.76	0.65	0.9794	0.0137	0.0001
620.38	0.75	0.64	0.9795	0.0138	0.0001
620.37	0.75	0.64	0.9797	0.0139	0.0001
620.36	0.75	0.63	0.9799	0.0139	0.0001
620.35	0.75	0.62	0.9800	0.0140	0.0001
620.34	0.75	0.61	0.9802	0.0141	0.0001
620.33	0.74	0.60	0.9803	0.0141	0.0001
620.32	0.74	0.60	0.9805	0.0142	0.0001
620.31	0.74	0.59	0.9807	0.0142	0.0001
620.30	0.74	0.58	0.9808	0.0143	0.0001
620.29	0.74	0.57	0.9810	0.0143	0.0001
620.28	0.73	0.57	0.9811	0.0143	0.0001
620.27	0.73	0.56	0.9813	0.0144	0.0001

$$Z_u = \rho_{ro} \beta_{ao} H_o / [\rho_{ro} \beta_{ao} - (1 - \rho_{ro}) \beta_{ow}]$$

$$= 620.94 \text{ feet}$$

where:

$$\rho_{ro} = 0.7903$$

$$\beta_{ao} = 2.74$$

$$\beta_{ow} = 3.41$$

$$H_o = 2.78 \text{ feet}$$

$$Z_{ow} = 616.78 \text{ feet}$$

$$Z_{ao} = 619.56 \text{ feet}$$

Other parameters used in calculations (from Data Entry - MWs)

$$S_m = 0.046$$

$$\alpha = 0.125 \text{ /foot}$$

$$n = 3.005$$

$$m = 0.334442596$$

$$dZ = 0.01 \text{ feet} \quad \text{Integration increment (0.01 to 1.0)}$$

$$\phi = 0.437$$

Oil Specific Volume

$$\Sigma \phi S_{of} dZ = 9.6131E-03 \text{ ft}^3/\text{ft}^2 \quad \text{Oil Specific Volume}$$

620.26	0.73	0.55	0.9815	0.0144	0.0001
620.25	0.73	0.54	0.9816	0.0144	0.0001
620.24	0.72	0.53	0.9818	0.0144	0.0001
620.23	0.72	0.53	0.9819	0.0144	0.0001
620.22	0.72	0.52	0.9821	0.0144	0.0001
620.21	0.72	0.51	0.9822	0.0144	0.0001
620.20	0.72	0.50	0.9824	0.0144	0.0001
620.19	0.71	0.49	0.9825	0.0144	0.0001
620.18	0.71	0.49	0.9827	0.0144	0.0001
620.17	0.71	0.48	0.9828	0.0144	0.0001
620.16	0.71	0.47	0.9830	0.0144	0.0001
620.15	0.71	0.46	0.9831	0.0144	0.0001
620.14	0.70	0.45	0.9833	0.0144	0.0001
620.13	0.70	0.45	0.9834	0.0143	0.0001
620.12	0.70	0.44	0.9836	0.0143	0.0001
620.11	0.70	0.43	0.9837	0.0143	0.0001
620.10	0.70	0.42	0.9839	0.0142	0.0001
620.09	0.69	0.42	0.9840	0.0142	0.0001
620.08	0.69	0.41	0.9841	0.0142	0.0001
620.07	0.69	0.40	0.9843	0.0141	0.0001
620.06	0.69	0.39	0.9844	0.0141	0.0001
620.05	0.68	0.38	0.9846	0.0140	0.0001
620.04	0.68	0.38	0.9847	0.0140	0.0001
620.03	0.68	0.37	0.9848	0.0139	0.0001
620.02	0.68	0.36	0.9850	0.0139	0.0001
620.01	0.68	0.35	0.9851	0.0138	0.0001
620.00	0.67	0.34	0.9852	0.0137	0.0001
619.99	0.67	0.34	0.9854	0.0137	0.0001
619.98	0.67	0.33	0.9855	0.0136	0.0001
619.97	0.67	0.32	0.9857	0.0135	0.0001
619.96	0.67	0.31	0.9858	0.0135	0.0001
619.95	0.66	0.30	0.9859	0.0134	0.0001
619.94	0.66	0.30	0.9860	0.0133	0.0001
619.93	0.66	0.29	0.9862	0.0132	0.0001
619.92	0.66	0.28	0.9863	0.0131	0.0001
619.91	0.66	0.27	0.9864	0.0131	0.0001
619.90	0.65	0.26	0.9866	0.0130	0.0001
619.89	0.65	0.26	0.9867	0.0129	0.0001
619.88	0.65	0.25	0.9868	0.0128	0.0001
619.87	0.65	0.24	0.9869	0.0127	0.0001
619.86	0.64	0.23	0.9871	0.0126	0.0001
619.85	0.64	0.23	0.9872	0.0125	0.0001
619.84	0.64	0.22	0.9873	0.0124	0.0001
619.83	0.64	0.21	0.9874	0.0123	0.0001
619.82	0.64	0.20	0.9876	0.0122	0.0001
619.81	0.63	0.19	0.9877	0.0121	0.0001
619.80	0.63	0.19	0.9878	0.0120	0.0001
619.79	0.63	0.18	0.9879	0.0119	0.0001
619.78	0.63	0.17	0.9880	0.0118	0.0001
619.77	0.63	0.16	0.9882	0.0117	0.0001
619.76	0.62	0.15	0.9883	0.0116	0.0001
619.75	0.62	0.15	0.9884	0.0115	0.0001
619.74	0.62	0.14	0.9885	0.0114	0.0000
619.73	0.62	0.13	0.9886	0.0113	0.0000
619.72	0.62	0.12	0.9887	0.0112	0.0000
619.71	0.61	0.11	0.9888	0.0111	0.0000
619.70	0.61	0.11	0.9890	0.0110	0.0000
619.69	0.61	0.10	0.9891	0.0109	0.0000
619.68	0.61	0.09	0.9892	0.0108	0.0000
619.67	0.61	0.08	0.9893	0.0107	0.0000
619.66	0.60	0.08	0.9894	0.0106	0.0000
619.65	0.60	0.07	0.9895	0.0105	0.0000
619.64	0.60	0.06	0.9896	0.0104	0.0000
619.63	0.60	0.05	0.9897	0.0103	0.0000
619.62	0.59	0.04	0.9898	0.0102	0.0000
619.61	0.59	0.04	0.9899	0.0101	0.0000
619.60	0.59	0.03	0.9900	0.0100	0.0000
619.59	0.59	0.02	0.9901	0.0099	0.0000
619.58	0.59	0.01	0.9902	0.0098	0.0000
619.57	0.58	0.00	0.9904	0.0096	0.0000
619.56	0.58	0.00	0.9905	0.0095	0.0000
619.55	0.58	0.00	0.9906	0.0094	0.0000
619.54	0.58	0.00	0.9907	0.0093	0.0000
619.53	0.58	0.00	0.9908	0.0092	0.0000
619.52	0.57	0.00	0.9909	0.0091	0.0000
619.51	0.57	0.00	0.9910	0.0090	0.0000
619.50	0.57	0.00	0.9911	0.0089	0.0000
619.49	0.57	0.00	0.9912	0.0088	0.0000
619.48	0.57	0.00	0.9912	0.0088	0.0000

619.47	0.56	0.00	0.9913	0.0087	0.0000
619.46	0.56	0.00	0.9914	0.0086	0.0000
619.45	0.56	0.00	0.9915	0.0085	0.0000
619.44	0.56	0.00	0.9916	0.0084	0.0000
619.43	0.55	0.00	0.9917	0.0083	0.0000
619.42	0.55	0.00	0.9918	0.0082	0.0000
619.41	0.55	0.00	0.9919	0.0081	0.0000
619.40	0.55	0.00	0.9920	0.0080	0.0000
619.39	0.55	0.00	0.9921	0.0079	0.0000
619.38	0.54	0.00	0.9922	0.0078	0.0000
619.37	0.54	0.00	0.9923	0.0077	0.0000
619.36	0.54	0.00	0.9924	0.0076	0.0000
619.35	0.54	0.00	0.9924	0.0076	0.0000
619.34	0.54	0.00	0.9925	0.0075	0.0000
619.33	0.53	0.00	0.9926	0.0074	0.0000
619.32	0.53	0.00	0.9927	0.0073	0.0000
619.31	0.53	0.00	0.9928	0.0072	0.0000
619.30	0.53	0.00	0.9929	0.0071	0.0000
619.29	0.53	0.00	0.9930	0.0070	0.0000
619.28	0.52	0.00	0.9930	0.0070	0.0000
619.27	0.52	0.00	0.9931	0.0069	0.0000
619.26	0.52	0.00	0.9932	0.0068	0.0000
619.25	0.52	0.00	0.9933	0.0067	0.0000
619.24	0.51	0.00	0.9934	0.0066	0.0000
619.23	0.51	0.00	0.9934	0.0066	0.0000
619.22	0.51	0.00	0.9935	0.0065	0.0000
619.21	0.51	0.00	0.9936	0.0064	0.0000
619.20	0.51	0.00	0.9937	0.0063	0.0000
619.19	0.50	0.00	0.9938	0.0062	0.0000
619.18	0.50	0.00	0.9938	0.0062	0.0000
619.17	0.50	0.00	0.9939	0.0061	0.0000
619.16	0.50	0.00	0.9940	0.0060	0.0000
619.15	0.50	0.00	0.9941	0.0059	0.0000
619.14	0.49	0.00	0.9941	0.0059	0.0000
619.13	0.49	0.00	0.9942	0.0058	0.0000
619.12	0.49	0.00	0.9943	0.0057	0.0000
619.11	0.49	0.00	0.9944	0.0056	0.0000
619.10	0.49	0.00	0.9944	0.0056	0.0000
619.09	0.48	0.00	0.9945	0.0055	0.0000
619.08	0.48	0.00	0.9946	0.0054	0.0000
619.07	0.48	0.00	0.9946	0.0054	0.0000
619.06	0.48	0.00	0.9947	0.0053	0.0000
619.05	0.47	0.00	0.9948	0.0052	0.0000
619.04	0.47	0.00	0.9949	0.0051	0.0000
619.03	0.47	0.00	0.9949	0.0051	0.0000
619.02	0.47	0.00	0.9950	0.0050	0.0000
619.01	0.47	0.00	0.9951	0.0049	0.0000
619.00	0.46	0.00	0.9951	0.0049	0.0000
618.99	0.46	0.00	0.9952	0.0048	0.0000
618.98	0.46	0.00	0.9953	0.0047	0.0000
618.97	0.46	0.00	0.9953	0.0047	0.0000
618.96	0.46	0.00	0.9954	0.0046	0.0000
618.95	0.45	0.00	0.9954	0.0046	0.0000
618.94	0.45	0.00	0.9955	0.0045	0.0000
618.93	0.45	0.00	0.9956	0.0044	0.0000
618.92	0.45	0.00	0.9956	0.0044	0.0000
618.91	0.45	0.00	0.9957	0.0043	0.0000
618.90	0.44	0.00	0.9958	0.0042	0.0000
618.89	0.44	0.00	0.9958	0.0042	0.0000
618.88	0.44	0.00	0.9959	0.0041	0.0000
618.87	0.44	0.00	0.9959	0.0041	0.0000
618.86	0.44	0.00	0.9960	0.0040	0.0000
618.85	0.43	0.00	0.9960	0.0040	0.0000
618.84	0.43	0.00	0.9961	0.0039	0.0000
618.83	0.43	0.00	0.9962	0.0038	0.0000
618.82	0.43	0.00	0.9962	0.0038	0.0000
618.81	0.42	0.00	0.9963	0.0037	0.0000
618.80	0.42	0.00	0.9963	0.0037	0.0000
618.79	0.42	0.00	0.9964	0.0036	0.0000
618.78	0.42	0.00	0.9964	0.0036	0.0000
618.77	0.42	0.00	0.9965	0.0035	0.0000
618.76	0.41	0.00	0.9965	0.0035	0.0000
618.75	0.41	0.00	0.9966	0.0034	0.0000
618.74	0.41	0.00	0.9966	0.0034	0.0000
618.73	0.41	0.00	0.9967	0.0033	0.0000
618.72	0.41	0.00	0.9967	0.0033	0.0000
618.71	0.40	0.00	0.9968	0.0032	0.0000
618.70	0.40	0.00	0.9968	0.0032	0.0000
618.69	0.40	0.00	0.9969	0.0031	0.0000



618.68	0.40	0.00	0.9969	0.0031	0.0000
618.67	0.40	0.00	0.9970	0.0030	0.0000
618.66	0.39	0.00	0.9970	0.0030	0.0000
618.65	0.39	0.00	0.9971	0.0029	0.0000
618.64	0.39	0.00	0.9971	0.0029	0.0000
618.63	0.39	0.00	0.9972	0.0028	0.0000
618.62	0.38	0.00	0.9972	0.0028	0.0000
618.61	0.38	0.00	0.9973	0.0027	0.0000
618.60	0.38	0.00	0.9973	0.0027	0.0000
618.59	0.38	0.00	0.9974	0.0026	0.0000
618.58	0.38	0.00	0.9974	0.0026	0.0000
618.57	0.37	0.00	0.9974	0.0026	0.0000
618.56	0.37	0.00	0.9975	0.0025	0.0000
618.55	0.37	0.00	0.9975	0.0025	0.0000
618.54	0.37	0.00	0.9976	0.0024	0.0000
618.53	0.37	0.00	0.9976	0.0024	0.0000
618.52	0.36	0.00	0.9977	0.0023	0.0000
618.51	0.36	0.00	0.9977	0.0023	0.0000
618.50	0.36	0.00	0.9977	0.0023	0.0000
618.49	0.36	0.00	0.9978	0.0022	0.0000
618.48	0.36	0.00	0.9978	0.0022	0.0000
618.47	0.35	0.00	0.9978	0.0022	0.0000
618.46	0.35	0.00	0.9979	0.0021	0.0000
618.45	0.35	0.00	0.9979	0.0021	0.0000
618.44	0.35	0.00	0.9980	0.0020	0.0000
618.43	0.34	0.00	0.9980	0.0020	0.0000
618.42	0.34	0.00	0.9980	0.0020	0.0000
618.41	0.34	0.00	0.9981	0.0019	0.0000
618.40	0.34	0.00	0.9981	0.0019	0.0000
618.39	0.34	0.00	0.9981	0.0019	0.0000
618.38	0.33	0.00	0.9982	0.0018	0.0000
618.37	0.33	0.00	0.9982	0.0018	0.0000
618.36	0.33	0.00	0.9982	0.0018	0.0000
618.35	0.33	0.00	0.9983	0.0017	0.0000
618.34	0.33	0.00	0.9983	0.0017	0.0000
618.33	0.32	0.00	0.9983	0.0017	0.0000
618.32	0.32	0.00	0.9984	0.0016	0.0000
618.31	0.32	0.00	0.9984	0.0016	0.0000
618.30	0.32	0.00	0.9984	0.0016	0.0000
618.29	0.32	0.00	0.9985	0.0015	0.0000
618.28	0.31	0.00	0.9985	0.0015	0.0000
618.27	0.31	0.00	0.9985	0.0015	0.0000
618.26	0.31	0.00	0.9986	0.0014	0.0000
618.25	0.31	0.00	0.9986	0.0014	0.0000
618.24	0.31	0.00	0.9986	0.0014	0.0000
618.23	0.30	0.00	0.9986	0.0014	0.0000
618.22	0.30	0.00	0.9987	0.0013	0.0000
618.21	0.30	0.00	0.9987	0.0013	0.0000
618.20	0.30	0.00	0.9987	0.0013	0.0000
618.19	0.29	0.00	0.9988	0.0012	0.0000
618.18	0.29	0.00	0.9988	0.0012	0.0000
618.17	0.29	0.00	0.9988	0.0012	0.0000
618.16	0.29	0.00	0.9988	0.0012	0.0000
618.15	0.29	0.00	0.9989	0.0011	0.0000
618.14	0.28	0.00	0.9989	0.0011	0.0000
618.13	0.28	0.00	0.9989	0.0011	0.0000
618.12	0.28	0.00	0.9989	0.0011	0.0000
618.11	0.28	0.00	0.9990	0.0010	0.0000
618.10	0.28	0.00	0.9990	0.0010	0.0000
618.09	0.27	0.00	0.9990	0.0010	0.0000
618.08	0.27	0.00	0.9990	0.0010	0.0000
618.07	0.27	0.00	0.9990	0.0010	0.0000
618.06	0.27	0.00	0.9991	0.0009	0.0000
618.05	0.27	0.00	0.9991	0.0009	0.0000
618.04	0.26	0.00	0.9991	0.0009	0.0000
618.03	0.26	0.00	0.9991	0.0009	0.0000
618.02	0.26	0.00	0.9992	0.0008	0.0000
618.01	0.26	0.00	0.9992	0.0008	0.0000
618.00	0.25	0.00	0.9992	0.0008	0.0000
617.99	0.25	0.00	0.9992	0.0008	0.0000
617.98	0.25	0.00	0.9992	0.0008	0.0000
617.97	0.25	0.00	0.9993	0.0007	0.0000
617.96	0.25	0.00	0.9993	0.0007	0.0000
617.95	0.24	0.00	0.9993	0.0007	0.0000
617.94	0.24	0.00	0.9993	0.0007	0.0000
617.93	0.24	0.00	0.9993	0.0007	0.0000
617.92	0.24	0.00	0.9993	0.0007	0.0000
617.91	0.24	0.00	0.9994	0.0006	0.0000
617.90	0.23	0.00	0.9994	0.0006	0.0000



617.10	0.07	0.00	1.0000	0.0000	0.0000
617.09	0.06	0.00	1.0000	0.0000	0.0000
617.08	0.06	0.00	1.0000	0.0000	0.0000
617.07	0.06	0.00	1.0000	0.0000	0.0000
617.06	0.06	0.00	1.0000	0.0000	0.0000
617.05	0.06	0.00	1.0000	0.0000	0.0000
617.04	0.05	0.00	1.0000	0.0000	0.0000
617.03	0.05	0.00	1.0000	0.0000	0.0000
617.02	0.05	0.00	1.0000	0.0000	0.0000
617.01	0.05	0.00	1.0000	0.0000	0.0000
617.00	0.05	0.00	1.0000	0.0000	0.0000
616.99	0.04	0.00	1.0000	0.0000	0.0000
616.98	0.04	0.00	1.0000	0.0000	0.0000
616.97	0.04	0.00	1.0000	0.0000	0.0000
616.96	0.04	0.00	1.0000	0.0000	0.0000
616.95	0.03	0.00	1.0000	0.0000	0.0000
616.94	0.03	0.00	1.0000	0.0000	0.0000
616.93	0.03	0.00	1.0000	0.0000	0.0000
616.92	0.03	0.00	1.0000	0.0000	0.0000
616.91	0.03	0.00	1.0000	0.0000	0.0000
616.90	0.02	0.00	1.0000	0.0000	0.0000
616.89	0.02	0.00	1.0000	0.0000	0.0000
616.88	0.02	0.00	1.0000	0.0000	0.0000
616.87	0.02	0.00	1.0000	0.0000	0.0000
616.86	0.02	0.00	1.0000	0.0000	0.0000
616.85	0.01	0.00	1.0000	0.0000	0.0000
616.84	0.01	0.00	1.0000	0.0000	0.0000
616.83	0.01	0.00	1.0000	0.0000	0.0000
616.82	0.01	0.00	1.0000	0.0000	0.0000
616.81	0.01	0.00	1.0000	0.0000	0.0000
616.80	0.00	0.00	1.0000	0.0000	0.0000
616.79	0.00	0.00	1.0000	0.0000	0.0000
Zow = 616.78	0.00	0.00	1.0000	0.0000	0.0000
			Oil Specific Volume	0.0096	ft <sup>3</sup> /ft <sup>2</sup>

Data Entry Worksheet for Soil Samples -- Oil Specific Volume (OSV) Calculations

Project No. = 406   = User must enter the soil or fluid parameter, or lab data, as appropriate  
 Boring Designation = MW-23

Soil Parameters

Fluid Parameters

Oil Parameters

Required to Estimate OSV - Soil

Required to Estimate OSV - Soil

$\rho_b = 1.6 \text{ g/cm}^3$  Bulk density of soil

$\rho_o = 0.7903 \text{ g/cm}^3$  Oil density

Soil Sample Data

Sample Intervals (maximum 21 samples)

	Feet (bgs)	to	Feet (bgs)	GRO or DRO (mg/kg)
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				

Deepest sample must be entered in this row

## Data Entry Worksheet for Monitoring Well Fluid Data -- Oil Specific Volume (OSV) Calculations

Project No. = 406  
Boring Designation = MW-23

= User must enter the soil or fluid parameter, or lab data, as appropriate

### Soil Parameters

#### Required to Estimate OSV - MWs

$\phi$  = 0.437 Total porosity  
 $\sigma_{ow}$  = 18.2 dynes/cm Oil/Water Interfacial Tension  
 $\sigma_{ao}$  = 22.7 dynes/cm Air/Oil Surface Tension  
 $\sigma_{aw}$  = 62.1 dynes/cm Air/Water Surface Tension  
 $\alpha$  = 0.125 /foot Van Genuchten mean pore-size parameter  
 $n$  = 3.00500 Van Genuchten pore-size distribution exponent  
 $S_m$  = 0.046 Irreducible water saturation

### Fluid Parameters

$\rho_{ro}$  = 0.7903 Ratio of oil to water density  
 $\beta_{ao}$  = 2.74 Ratio of water surface tension to oil surface tension  
 $\beta_{ow}$  = 3.41 Ratio of water surface tension to oil-water interfacial tension  
 $Z_{ow}$  = 18.68 feet Depth to oil/air interface  
 $Z_{ao}$  = 21.77 feet Depth to oil/water interface  
 $S_m$  = 0.046 Water saturation at field capacity  
 $\alpha$  = 0.125 /foot Van Genuchten mean pore-size parameter  
 $n$  = 3.00500 Van Genuchten pore-size distribution exponent  
 $m$  = 0.334443 Calculated from "n" (Burdine)  
 $dZ$  = 0.01 feet Integration increment (0.01 to 1.0)  
TOC = 636.91 feet Elevation of TOC or measuring point



Oil Specific Volume Calculation Spreadsheet for Free-phase Hydrocarbon in Monitoring Wells

Project No. 406  
 Boring Designation MW-23

**DO NOT CHANGE ANY CELLS ON THIS WORKSHEET**

Z (feet)	h <sub>ow</sub> (feet)	h <sub>ao</sub> (feet)	S <sub>w</sub> (-)	S <sub>of</sub> (-)	φ S <sub>of</sub> dZ (ft <sup>3</sup> /ft <sup>2</sup> )
Z <sub>u</sub> = 619.76	0.97	1.21	0.9578	0.0000	0.0000
619.75	0.97	1.20	0.9581	0.0005	0.0000
619.74	0.96	1.19	0.9583	0.0010	0.0000
619.73	0.96	1.18	0.9586	0.0015	0.0000
619.72	0.96	1.18	0.9588	0.0020	0.0000
619.71	0.96	1.17	0.9591	0.0025	0.0000
619.70	0.96	1.16	0.9593	0.0030	0.0000
619.69	0.95	1.15	0.9596	0.0035	0.0000
619.68	0.95	1.14	0.9598	0.0040	0.0000
619.67	0.95	1.14	0.9601	0.0044	0.0000
619.66	0.95	1.13	0.9603	0.0049	0.0000
619.65	0.95	1.12	0.9606	0.0053	0.0000
619.64	0.94	1.11	0.9608	0.0057	0.0000
619.63	0.94	1.11	0.9611	0.0062	0.0000
619.62	0.94	1.10	0.9613	0.0066	0.0000
619.61	0.94	1.09	0.9616	0.0070	0.0000
619.60	0.93	1.08	0.9618	0.0074	0.0000
619.59	0.93	1.07	0.9621	0.0078	0.0000
619.58	0.93	1.07	0.9623	0.0082	0.0000
619.57	0.93	1.06	0.9626	0.0086	0.0000
619.56	0.93	1.05	0.9628	0.0090	0.0000
619.55	0.92	1.04	0.9630	0.0093	0.0000
619.54	0.92	1.03	0.9633	0.0097	0.0000
619.53	0.92	1.03	0.9635	0.0101	0.0000
619.52	0.92	1.02	0.9638	0.0104	0.0000
619.51	0.92	1.01	0.9640	0.0108	0.0000
619.50	0.91	1.00	0.9642	0.0111	0.0000
619.49	0.91	0.99	0.9645	0.0114	0.0000
619.48	0.91	0.99	0.9647	0.0117	0.0001
619.47	0.91	0.98	0.9649	0.0121	0.0001
619.46	0.91	0.97	0.9652	0.0124	0.0001
619.45	0.90	0.96	0.9654	0.0127	0.0001
619.44	0.90	0.96	0.9656	0.0129	0.0001
619.43	0.90	0.95	0.9658	0.0132	0.0001
619.42	0.90	0.94	0.9661	0.0135	0.0001
619.41	0.90	0.93	0.9663	0.0138	0.0001
619.40	0.89	0.92	0.9665	0.0140	0.0001
619.39	0.89	0.92	0.9668	0.0143	0.0001
619.38	0.89	0.91	0.9670	0.0146	0.0001
619.37	0.89	0.90	0.9672	0.0148	0.0001
619.36	0.88	0.89	0.9674	0.0150	0.0001
619.35	0.88	0.88	0.9676	0.0153	0.0001
619.34	0.88	0.88	0.9679	0.0155	0.0001
619.33	0.88	0.87	0.9681	0.0157	0.0001
619.32	0.88	0.86	0.9683	0.0159	0.0001
619.31	0.87	0.85	0.9685	0.0161	0.0001
619.30	0.87	0.84	0.9687	0.0163	0.0001
619.29	0.87	0.84	0.9690	0.0165	0.0001
619.28	0.87	0.83	0.9692	0.0167	0.0001
619.27	0.87	0.82	0.9694	0.0169	0.0001
619.26	0.86	0.81	0.9696	0.0171	0.0001
619.25	0.86	0.80	0.9698	0.0172	0.0001
619.24	0.86	0.80	0.9700	0.0174	0.0001
619.23	0.86	0.79	0.9702	0.0175	0.0001
619.22	0.86	0.78	0.9704	0.0177	0.0001
619.21	0.85	0.77	0.9707	0.0178	0.0001
619.20	0.85	0.77	0.9709	0.0180	0.0001
619.19	0.85	0.76	0.9711	0.0181	0.0001
619.18	0.85	0.75	0.9713	0.0182	0.0001
619.17	0.84	0.74	0.9715	0.0183	0.0001
619.16	0.84	0.73	0.9717	0.0185	0.0001
619.15	0.84	0.73	0.9719	0.0186	0.0001
619.14	0.84	0.72	0.9721	0.0187	0.0001
619.13	0.84	0.71	0.9723	0.0188	0.0001
619.12	0.83	0.70	0.9725	0.0189	0.0001
619.11	0.83	0.69	0.9727	0.0189	0.0001
619.10	0.83	0.69	0.9729	0.0190	0.0001
619.09	0.83	0.68	0.9731	0.0191	0.0001

$$Z_u = \rho_{ro} \beta_{ao} H_o / [\rho_{ro} \beta_{ao} - (1 - \rho_{ro}) \beta_{ow}]$$

$$= 619.76 \text{ feet}$$

where:

$$\rho_{ro} = 0.7903$$

$$\beta_{ao} = 2.74$$

$$\beta_{ow} = 3.41$$

$$H_o = 3.09 \text{ feet}$$

$$Z_{ow} = 615.14 \text{ feet}$$

$$Z_{ao} = 618.23 \text{ feet}$$

Other parameters used in calculations (from Data Entry - MWs)

$$S_m = 0.046$$

$$\alpha = 0.125 \text{ /foot}$$

$$n = 3.005$$

$$m = 0.334442596$$

$$dZ = 0.01 \text{ feet} \quad \text{Integration increment (0.01 to 1.0)}$$

$$\phi = 0.437$$

Oil Specific Volume

$$\Sigma \phi S_{of} dZ = 1.4577E-02 \text{ ft}^3/\text{ft}^2 \quad \text{Oil Specific Volume}$$

619.08	0.83	0.67	0.9733	0.0192	0.0001
619.07	0.82	0.66	0.9735	0.0192	0.0001
619.06	0.82	0.65	0.9737	0.0193	0.0001
619.05	0.82	0.65	0.9739	0.0193	0.0001
619.04	0.82	0.64	0.9741	0.0194	0.0001
619.03	0.82	0.63	0.9743	0.0194	0.0001
619.02	0.81	0.62	0.9745	0.0195	0.0001
619.01	0.81	0.62	0.9746	0.0195	0.0001
619.00	0.81	0.61	0.9748	0.0196	0.0001
618.99	0.81	0.60	0.9750	0.0196	0.0001
618.98	0.80	0.59	0.9752	0.0196	0.0001
618.97	0.80	0.58	0.9754	0.0196	0.0001
618.96	0.80	0.58	0.9756	0.0196	0.0001
618.95	0.80	0.57	0.9758	0.0196	0.0001
618.94	0.80	0.56	0.9760	0.0196	0.0001
618.93	0.79	0.55	0.9761	0.0196	0.0001
618.92	0.79	0.54	0.9763	0.0196	0.0001
618.91	0.79	0.54	0.9765	0.0196	0.0001
618.90	0.79	0.53	0.9767	0.0196	0.0001
618.89	0.79	0.52	0.9769	0.0196	0.0001
618.88	0.78	0.51	0.9770	0.0196	0.0001
618.87	0.78	0.50	0.9772	0.0195	0.0001
618.86	0.78	0.50	0.9774	0.0195	0.0001
618.85	0.78	0.49	0.9776	0.0195	0.0001
618.84	0.78	0.48	0.9778	0.0195	0.0001
618.83	0.77	0.47	0.9779	0.0194	0.0001
618.82	0.77	0.47	0.9781	0.0194	0.0001
618.81	0.77	0.46	0.9783	0.0193	0.0001
618.80	0.77	0.45	0.9784	0.0193	0.0001
618.79	0.77	0.44	0.9786	0.0192	0.0001
618.78	0.76	0.43	0.9788	0.0192	0.0001
618.77	0.76	0.43	0.9790	0.0191	0.0001
618.76	0.76	0.42	0.9791	0.0190	0.0001
618.75	0.76	0.41	0.9793	0.0190	0.0001
618.74	0.75	0.40	0.9795	0.0189	0.0001
618.73	0.75	0.39	0.9796	0.0188	0.0001
618.72	0.75	0.39	0.9798	0.0188	0.0001
618.71	0.75	0.38	0.9800	0.0187	0.0001
618.70	0.75	0.37	0.9801	0.0186	0.0001
618.69	0.74	0.36	0.9803	0.0185	0.0001
618.68	0.74	0.35	0.9805	0.0184	0.0001
618.67	0.74	0.35	0.9806	0.0183	0.0001
618.66	0.74	0.34	0.9808	0.0183	0.0001
618.65	0.74	0.33	0.9809	0.0182	0.0001
618.64	0.73	0.32	0.9811	0.0181	0.0001
618.63	0.73	0.31	0.9812	0.0180	0.0001
618.62	0.73	0.31	0.9814	0.0179	0.0001
618.61	0.73	0.30	0.9816	0.0178	0.0001
618.60	0.73	0.29	0.9817	0.0177	0.0001
618.59	0.72	0.28	0.9819	0.0176	0.0001
618.58	0.72	0.28	0.9820	0.0174	0.0001
618.57	0.72	0.27	0.9822	0.0173	0.0001
618.56	0.72	0.26	0.9823	0.0172	0.0001
618.55	0.71	0.25	0.9825	0.0171	0.0001
618.54	0.71	0.24	0.9826	0.0170	0.0001
618.53	0.71	0.24	0.9828	0.0169	0.0001
618.52	0.71	0.23	0.9829	0.0168	0.0001
618.51	0.71	0.22	0.9831	0.0167	0.0001
618.50	0.70	0.21	0.9832	0.0165	0.0001
618.49	0.70	0.20	0.9834	0.0164	0.0001
618.48	0.70	0.20	0.9835	0.0163	0.0001
618.47	0.70	0.19	0.9837	0.0162	0.0001
618.46	0.70	0.18	0.9838	0.0160	0.0001
618.45	0.69	0.17	0.9840	0.0159	0.0001
618.44	0.69	0.16	0.9841	0.0158	0.0001
618.43	0.69	0.16	0.9842	0.0157	0.0001
618.42	0.69	0.15	0.9844	0.0155	0.0001
618.41	0.69	0.14	0.9845	0.0154	0.0001
618.40	0.68	0.13	0.9847	0.0153	0.0001
618.39	0.68	0.13	0.9848	0.0152	0.0001
618.38	0.68	0.12	0.9849	0.0150	0.0001
618.37	0.68	0.11	0.9851	0.0149	0.0001
618.36	0.67	0.10	0.9852	0.0148	0.0001
618.35	0.67	0.09	0.9853	0.0146	0.0001
618.34	0.67	0.09	0.9855	0.0145	0.0001
618.33	0.67	0.08	0.9856	0.0144	0.0001
618.32	0.67	0.07	0.9857	0.0143	0.0001
618.31	0.66	0.06	0.9859	0.0141	0.0001
618.30	0.66	0.05	0.9860	0.0140	0.0001



618.29	0.66	0.05	0.9861	0.0139	0.0001
618.28	0.66	0.04	0.9863	0.0137	0.0001
618.27	0.66	0.03	0.9864	0.0136	0.0001
618.26	0.65	0.02	0.9865	0.0135	0.0001
618.25	0.65	0.01	0.9866	0.0134	0.0001
618.24	0.65	0.01	0.9868	0.0132	0.0001
618.23	0.65	0.00	0.9869	0.0131	0.0001
618.22	0.65	0.00	0.9870	0.0130	0.0001
618.21	0.64	0.00	0.9871	0.0129	0.0001
618.20	0.64	0.00	0.9873	0.0127	0.0001
618.19	0.64	0.00	0.9874	0.0126	0.0001
618.18	0.64	0.00	0.9875	0.0125	0.0001
618.17	0.64	0.00	0.9876	0.0124	0.0001
618.16	0.63	0.00	0.9878	0.0122	0.0001
618.15	0.63	0.00	0.9879	0.0121	0.0001
618.14	0.63	0.00	0.9880	0.0120	0.0001
618.13	0.63	0.00	0.9881	0.0119	0.0001
618.12	0.62	0.00	0.9882	0.0118	0.0001
618.11	0.62	0.00	0.9883	0.0117	0.0001
618.10	0.62	0.00	0.9885	0.0115	0.0001
618.09	0.62	0.00	0.9886	0.0114	0.0000
618.08	0.62	0.00	0.9887	0.0113	0.0000
618.07	0.61	0.00	0.9888	0.0112	0.0000
618.06	0.61	0.00	0.9889	0.0111	0.0000
618.05	0.61	0.00	0.9890	0.0110	0.0000
618.04	0.61	0.00	0.9891	0.0109	0.0000
618.03	0.61	0.00	0.9893	0.0107	0.0000
618.02	0.60	0.00	0.9894	0.0106	0.0000
618.01	0.60	0.00	0.9895	0.0105	0.0000
618.00	0.60	0.00	0.9896	0.0104	0.0000
617.99	0.60	0.00	0.9897	0.0103	0.0000
617.98	0.60	0.00	0.9898	0.0102	0.0000
617.97	0.59	0.00	0.9899	0.0101	0.0000
617.96	0.59	0.00	0.9900	0.0100	0.0000
617.95	0.59	0.00	0.9901	0.0099	0.0000
617.94	0.59	0.00	0.9902	0.0098	0.0000
617.93	0.58	0.00	0.9903	0.0097	0.0000
617.92	0.58	0.00	0.9904	0.0096	0.0000
617.91	0.58	0.00	0.9905	0.0095	0.0000
617.90	0.58	0.00	0.9906	0.0094	0.0000
617.89	0.58	0.00	0.9907	0.0093	0.0000
617.88	0.57	0.00	0.9908	0.0092	0.0000
617.87	0.57	0.00	0.9909	0.0091	0.0000
617.86	0.57	0.00	0.9910	0.0090	0.0000
617.85	0.57	0.00	0.9911	0.0089	0.0000
617.84	0.57	0.00	0.9912	0.0088	0.0000
617.83	0.56	0.00	0.9913	0.0087	0.0000
617.82	0.56	0.00	0.9914	0.0086	0.0000
617.81	0.56	0.00	0.9915	0.0085	0.0000
617.80	0.56	0.00	0.9916	0.0084	0.0000
617.79	0.56	0.00	0.9917	0.0083	0.0000
617.78	0.55	0.00	0.9918	0.0082	0.0000
617.77	0.55	0.00	0.9919	0.0081	0.0000
617.76	0.55	0.00	0.9920	0.0080	0.0000
617.75	0.55	0.00	0.9921	0.0079	0.0000
617.74	0.54	0.00	0.9921	0.0079	0.0000
617.73	0.54	0.00	0.9922	0.0078	0.0000
617.72	0.54	0.00	0.9923	0.0077	0.0000
617.71	0.54	0.00	0.9924	0.0076	0.0000
617.70	0.54	0.00	0.9925	0.0075	0.0000
617.69	0.53	0.00	0.9926	0.0074	0.0000
617.68	0.53	0.00	0.9927	0.0073	0.0000
617.67	0.53	0.00	0.9928	0.0072	0.0000
617.66	0.53	0.00	0.9928	0.0072	0.0000
617.65	0.53	0.00	0.9929	0.0071	0.0000
617.64	0.52	0.00	0.9930	0.0070	0.0000
617.63	0.52	0.00	0.9931	0.0069	0.0000
617.62	0.52	0.00	0.9932	0.0068	0.0000
617.61	0.52	0.00	0.9933	0.0067	0.0000
617.60	0.52	0.00	0.9933	0.0067	0.0000
617.59	0.51	0.00	0.9934	0.0066	0.0000
617.58	0.51	0.00	0.9935	0.0065	0.0000
617.57	0.51	0.00	0.9936	0.0064	0.0000
617.56	0.51	0.00	0.9937	0.0063	0.0000
617.55	0.51	0.00	0.9937	0.0063	0.0000
617.54	0.50	0.00	0.9938	0.0062	0.0000
617.53	0.50	0.00	0.9939	0.0061	0.0000
617.52	0.50	0.00	0.9940	0.0060	0.0000
617.51	0.50	0.00	0.9940	0.0060	0.0000

617.50	0.49	0.00	0.9941	0.0059	0.0000
617.49	0.49	0.00	0.9942	0.0058	0.0000
617.48	0.49	0.00	0.9943	0.0057	0.0000
617.47	0.49	0.00	0.9943	0.0057	0.0000
617.46	0.49	0.00	0.9944	0.0056	0.0000
617.45	0.48	0.00	0.9945	0.0055	0.0000
617.44	0.48	0.00	0.9946	0.0054	0.0000
617.43	0.48	0.00	0.9946	0.0054	0.0000
617.42	0.48	0.00	0.9947	0.0053	0.0000
617.41	0.48	0.00	0.9948	0.0052	0.0000
617.40	0.47	0.00	0.9948	0.0052	0.0000
617.39	0.47	0.00	0.9949	0.0051	0.0000
617.38	0.47	0.00	0.9950	0.0050	0.0000
617.37	0.47	0.00	0.9950	0.0050	0.0000
617.36	0.47	0.00	0.9951	0.0049	0.0000
617.35	0.46	0.00	0.9952	0.0048	0.0000
617.34	0.46	0.00	0.9952	0.0048	0.0000
617.33	0.46	0.00	0.9953	0.0047	0.0000
617.32	0.46	0.00	0.9954	0.0046	0.0000
617.31	0.45	0.00	0.9954	0.0046	0.0000
617.30	0.45	0.00	0.9955	0.0045	0.0000
617.29	0.45	0.00	0.9955	0.0045	0.0000
617.28	0.45	0.00	0.9956	0.0044	0.0000
617.27	0.45	0.00	0.9957	0.0043	0.0000
617.26	0.44	0.00	0.9957	0.0043	0.0000
617.25	0.44	0.00	0.9958	0.0042	0.0000
617.24	0.44	0.00	0.9958	0.0042	0.0000
617.23	0.44	0.00	0.9959	0.0041	0.0000
617.22	0.44	0.00	0.9960	0.0040	0.0000
617.21	0.43	0.00	0.9960	0.0040	0.0000
617.20	0.43	0.00	0.9961	0.0039	0.0000
617.19	0.43	0.00	0.9961	0.0039	0.0000
617.18	0.43	0.00	0.9962	0.0038	0.0000
617.17	0.43	0.00	0.9962	0.0038	0.0000
617.16	0.42	0.00	0.9963	0.0037	0.0000
617.15	0.42	0.00	0.9964	0.0036	0.0000
617.14	0.42	0.00	0.9964	0.0036	0.0000
617.13	0.42	0.00	0.9965	0.0035	0.0000
617.12	0.41	0.00	0.9965	0.0035	0.0000
617.11	0.41	0.00	0.9966	0.0034	0.0000
617.10	0.41	0.00	0.9966	0.0034	0.0000
617.09	0.41	0.00	0.9967	0.0033	0.0000
617.08	0.41	0.00	0.9967	0.0033	0.0000
617.07	0.40	0.00	0.9968	0.0032	0.0000
617.06	0.40	0.00	0.9968	0.0032	0.0000
617.05	0.40	0.00	0.9969	0.0031	0.0000
617.04	0.40	0.00	0.9969	0.0031	0.0000
617.03	0.40	0.00	0.9970	0.0030	0.0000
617.02	0.39	0.00	0.9970	0.0030	0.0000
617.01	0.39	0.00	0.9971	0.0029	0.0000
617.00	0.39	0.00	0.9971	0.0029	0.0000
616.99	0.39	0.00	0.9972	0.0028	0.0000
616.98	0.39	0.00	0.9972	0.0028	0.0000
616.97	0.38	0.00	0.9973	0.0027	0.0000
616.96	0.38	0.00	0.9973	0.0027	0.0000
616.95	0.38	0.00	0.9973	0.0027	0.0000
616.94	0.38	0.00	0.9974	0.0026	0.0000
616.93	0.38	0.00	0.9974	0.0026	0.0000
616.92	0.37	0.00	0.9975	0.0025	0.0000
616.91	0.37	0.00	0.9975	0.0025	0.0000
616.90	0.37	0.00	0.9976	0.0024	0.0000
616.89	0.37	0.00	0.9976	0.0024	0.0000
616.88	0.36	0.00	0.9976	0.0024	0.0000
616.87	0.36	0.00	0.9977	0.0023	0.0000
616.86	0.36	0.00	0.9977	0.0023	0.0000
616.85	0.36	0.00	0.9978	0.0022	0.0000
616.84	0.36	0.00	0.9978	0.0022	0.0000
616.83	0.35	0.00	0.9978	0.0022	0.0000
616.82	0.35	0.00	0.9979	0.0021	0.0000
616.81	0.35	0.00	0.9979	0.0021	0.0000
616.80	0.35	0.00	0.9979	0.0021	0.0000
616.79	0.35	0.00	0.9980	0.0020	0.0000
616.78	0.34	0.00	0.9980	0.0020	0.0000
616.77	0.34	0.00	0.9981	0.0019	0.0000
616.76	0.34	0.00	0.9981	0.0019	0.0000
616.75	0.34	0.00	0.9981	0.0019	0.0000
616.74	0.34	0.00	0.9982	0.0018	0.0000
616.73	0.33	0.00	0.9982	0.0018	0.0000
616.72	0.33	0.00	0.9982	0.0018	0.0000





Oil Specific Volume      0.0146    ft<sup>3</sup>/ft<sup>2</sup>

Data Entry Worksheet for Soil Samples -- Oil Specific Volume (OSV) Calculations

Project No. = 406 [ ] = User must enter the soil or fluid parameter, or lab data, as appropriate  
Boring Designation = MW-24

Soil Parameters

Fluid Parameters

Oil Parameters

Required to Estimate OSV - Soil

Required to Estimate OSV - Soil

$\rho_b$  = 1.6 g/cm<sup>3</sup> Bulk density of soil

$\rho_o$  = 0.7903 g/cm<sup>3</sup> Oil density

Soil Sample Data

Sample Intervals (maximum 21 samples)

	Feet (bgs)	to	Feet (bgs)	GRO or DRO (mg/kg)
1	[ ]		[ ]	[ ]
2	[ ]		[ ]	[ ]
3	[ ]		[ ]	[ ]
4	[ ]		[ ]	[ ]
5	[ ]		[ ]	[ ]
6	[ ]		[ ]	[ ]
7	[ ]		[ ]	[ ]
8	[ ]		[ ]	[ ]
9	[ ]		[ ]	[ ]
10	[ ]		[ ]	[ ]
11	[ ]		[ ]	[ ]
12	[ ]		[ ]	[ ]
13	[ ]		[ ]	[ ]
14	[ ]		[ ]	[ ]
15	[ ]		[ ]	[ ]
16	[ ]		[ ]	[ ]
17	[ ]		[ ]	[ ]
18	[ ]		[ ]	[ ]
19	[ ]		[ ]	[ ]
20	[ ]		[ ]	[ ]
21	[ ]		[ ]	[ ]

Deepest sample must be entered in this row

## Data Entry Worksheet for Monitoring Well Fluid Data -- Oil Specific Volume (OSV) Calculations

Project No. = 406  
Boring Designation = MW-24

= User must enter the soil or fluid parameter, or lab data, as appropriate

### Soil Parameters

#### Required to Estimate OSV - MWs

$\phi$  = 0.437 Total porosity  
 $\sigma_{ow}$  = 18.2 dynes/cm Oil/Water Interfacial Tension  
 $\sigma_{ao}$  = 22.7 dynes/cm Air/Oil Surface Tension  
 $\sigma_{aw}$  = 62.1 dynes/cm Air/Water Surface Tension  
 $\alpha$  = 0.125 /foot Van Genuchten mean pore-size parameter  
 $n$  = 3.00500 Van Genuchten pore-size distribution exponent  
 $S_m$  = 0.046 Irreducible water saturation

### Fluid Parameters

$\rho_{ro}$  = 0.7903 Ratio of oil to water density  
 $\beta_{ao}$  = 2.74 Ratio of water surface tension to oil surface tension  
 $\beta_{ow}$  = 3.41 Ratio of water surface tension to oil-water interfacial tension  
 $Z_{ow}$  = 18.61 feet Depth to oil/air interface  
 $Z_{ao}$  = 22.93 feet Depth to oil/water interface  
 $S_m$  = 0.046 Water saturation at field capacity  
 $\alpha$  = 0.125 /foot Van Genuchten mean pore-size parameter  
 $n$  = 3.00500 Van Genuchten pore-size distribution exponent  
 $m$  = 0.334443 Calculated from "n" (Burdine)  
 $dZ$  = 0.01 feet Integration increment (0.01 to 1.0)  
TOC = 638.55 feet Elevation of TOC or measuring point





Oil Specific Volume Calculation Spreadsheet for Free-phase Hydrocarbon in Monitoring Wells

Project No. 406  
 Boring Designation MW-24

**DO NOT CHANGE ANY CELLS ON THIS WORKSHEET**

Z (feet)	h <sub>ow</sub> (feet)	h <sub>ao</sub> (feet)	S <sub>w</sub> (-)	S <sub>of</sub> (-)	φ S <sub>of</sub> dZ (ft <sup>3</sup> /ft <sup>2</sup> )
Z <sub>u</sub> = 622.08	1.35	1.69	0.8945	0.0000	0.0000
622.07	1.35	1.68	0.8949	0.0009	0.0000
622.06	1.35	1.67	0.8953	0.0017	0.0000
622.05	1.35	1.67	0.8957	0.0025	0.0000
622.04	1.35	1.66	0.8962	0.0034	0.0000
622.03	1.34	1.65	0.8966	0.0042	0.0000
622.02	1.34	1.64	0.8970	0.0050	0.0000
622.01	1.34	1.63	0.8974	0.0058	0.0000
622.00	1.34	1.63	0.8978	0.0067	0.0000
621.99	1.34	1.62	0.8983	0.0075	0.0000
621.98	1.33	1.61	0.8987	0.0083	0.0000
621.97	1.33	1.60	0.8991	0.0090	0.0000
621.96	1.33	1.59	0.8995	0.0098	0.0000
621.95	1.33	1.59	0.8999	0.0106	0.0000
621.94	1.32	1.58	0.9003	0.0114	0.0000
621.93	1.32	1.57	0.9007	0.0121	0.0001
621.92	1.32	1.56	0.9012	0.0129	0.0001
621.91	1.32	1.55	0.9016	0.0136	0.0001
621.90	1.32	1.55	0.9020	0.0144	0.0001
621.89	1.31	1.54	0.9024	0.0151	0.0001
621.88	1.31	1.53	0.9028	0.0158	0.0001
621.87	1.31	1.52	0.9032	0.0165	0.0001
621.86	1.31	1.51	0.9036	0.0173	0.0001
621.85	1.31	1.51	0.9040	0.0180	0.0001
621.84	1.30	1.50	0.9044	0.0187	0.0001
621.83	1.30	1.49	0.9048	0.0193	0.0001
621.82	1.30	1.48	0.9052	0.0200	0.0001
621.81	1.30	1.48	0.9056	0.0207	0.0001
621.80	1.30	1.47	0.9060	0.0214	0.0001
621.79	1.29	1.46	0.9064	0.0220	0.0001
621.78	1.29	1.45	0.9068	0.0227	0.0001
621.77	1.29	1.44	0.9072	0.0233	0.0001
621.76	1.29	1.44	0.9076	0.0240	0.0001
621.75	1.28	1.43	0.9080	0.0246	0.0001
621.74	1.28	1.42	0.9084	0.0252	0.0001
621.73	1.28	1.41	0.9088	0.0258	0.0001
621.72	1.28	1.40	0.9092	0.0264	0.0001
621.71	1.28	1.40	0.9096	0.0270	0.0001
621.70	1.27	1.39	0.9100	0.0276	0.0001
621.69	1.27	1.38	0.9104	0.0282	0.0001
621.68	1.27	1.37	0.9108	0.0288	0.0001
621.67	1.27	1.36	0.9112	0.0293	0.0001
621.66	1.27	1.36	0.9116	0.0299	0.0001
621.65	1.26	1.35	0.9120	0.0305	0.0001
621.64	1.26	1.34	0.9124	0.0310	0.0001
621.63	1.26	1.33	0.9128	0.0315	0.0001
621.62	1.26	1.33	0.9131	0.0321	0.0001
621.61	1.26	1.32	0.9135	0.0326	0.0001
621.60	1.25	1.31	0.9139	0.0331	0.0001
621.59	1.25	1.30	0.9143	0.0336	0.0001
621.58	1.25	1.29	0.9147	0.0341	0.0001
621.57	1.25	1.29	0.9151	0.0346	0.0002
621.56	1.24	1.28	0.9154	0.0351	0.0002
621.55	1.24	1.27	0.9158	0.0356	0.0002
621.54	1.24	1.26	0.9162	0.0360	0.0002
621.53	1.24	1.25	0.9166	0.0365	0.0002
621.52	1.24	1.25	0.9170	0.0369	0.0002
621.51	1.23	1.24	0.9173	0.0374	0.0002
621.50	1.23	1.23	0.9177	0.0378	0.0002
621.49	1.23	1.22	0.9181	0.0382	0.0002
621.48	1.23	1.21	0.9185	0.0387	0.0002
621.47	1.23	1.21	0.9188	0.0391	0.0002
621.46	1.22	1.20	0.9192	0.0395	0.0002
621.45	1.22	1.19	0.9196	0.0399	0.0002
621.44	1.22	1.18	0.9200	0.0403	0.0002
621.43	1.22	1.18	0.9203	0.0407	0.0002
621.42	1.22	1.17	0.9207	0.0410	0.0002
621.41	1.21	1.16	0.9211	0.0414	0.0002

$$Z_u = \rho_{ro} \beta_{ao} H_o / [\rho_{ro} \beta_{ao} - (1 - \rho_{ro}) \beta_{ow}]$$

$$= 622.08 \text{ feet}$$

where:

$$\rho_{ro} = 0.7903$$

$$\beta_{ao} = 2.74$$

$$\beta_{ow} = 3.41$$

$$H_o = 4.32 \text{ feet}$$

$$Z_{ow} = 615.62 \text{ feet}$$

$$Z_{ao} = 619.94 \text{ feet}$$

Other parameters used in calculations (from Data Entry - MWs)

$$S_m = 0.046$$

$$\alpha = 0.125 \text{ /foot}$$

$$n = 3.005$$

$$m = 0.334442596$$

$$dZ = 0.01 \text{ feet} \quad \text{Integration increment (0.01 to 1.0)}$$

$$\phi = 0.437$$

Oil Specific Volume

$$\Sigma \phi S_{of} dZ = 5.2913E-02 \text{ ft}^3/\text{ft}^2 \quad \text{Oil Specific Volume}$$

621.40	1.21	1.15	0.9214	0.0418	0.0002
621.39	1.21	1.14	0.9218	0.0421	0.0002
621.38	1.21	1.14	0.9222	0.0425	0.0002
621.37	1.21	1.13	0.9225	0.0428	0.0002
621.36	1.20	1.12	0.9229	0.0431	0.0002
621.35	1.20	1.11	0.9233	0.0434	0.0002
621.34	1.20	1.10	0.9236	0.0438	0.0002
621.33	1.20	1.10	0.9240	0.0441	0.0002
621.32	1.19	1.09	0.9243	0.0444	0.0002
621.31	1.19	1.08	0.9247	0.0447	0.0002
621.30	1.19	1.07	0.9251	0.0449	0.0002
621.29	1.19	1.06	0.9254	0.0452	0.0002
621.28	1.19	1.06	0.9258	0.0455	0.0002
621.27	1.18	1.05	0.9261	0.0457	0.0002
621.26	1.18	1.04	0.9265	0.0460	0.0002
621.25	1.18	1.03	0.9268	0.0462	0.0002
621.24	1.18	1.02	0.9272	0.0465	0.0002
621.23	1.18	1.02	0.9275	0.0467	0.0002
621.22	1.17	1.01	0.9279	0.0469	0.0002
621.21	1.17	1.00	0.9282	0.0472	0.0002
621.20	1.17	0.99	0.9286	0.0474	0.0002
621.19	1.17	0.99	0.9289	0.0476	0.0002
621.18	1.17	0.98	0.9293	0.0478	0.0002
621.17	1.16	0.97	0.9296	0.0480	0.0002
621.16	1.16	0.96	0.9300	0.0481	0.0002
621.15	1.16	0.95	0.9303	0.0483	0.0002
621.14	1.16	0.95	0.9307	0.0485	0.0002
621.13	1.15	0.94	0.9310	0.0486	0.0002
621.12	1.15	0.93	0.9314	0.0488	0.0002
621.11	1.15	0.92	0.9317	0.0490	0.0002
621.10	1.15	0.91	0.9320	0.0491	0.0002
621.09	1.15	0.91	0.9324	0.0492	0.0002
621.08	1.14	0.90	0.9327	0.0494	0.0002
621.07	1.14	0.89	0.9331	0.0495	0.0002
621.06	1.14	0.88	0.9334	0.0496	0.0002
621.05	1.14	0.87	0.9337	0.0497	0.0002
621.04	1.14	0.87	0.9341	0.0498	0.0002
621.03	1.13	0.86	0.9344	0.0499	0.0002
621.02	1.13	0.85	0.9347	0.0500	0.0002
621.01	1.13	0.84	0.9351	0.0501	0.0002
621.00	1.13	0.84	0.9354	0.0501	0.0002
620.99	1.13	0.83	0.9357	0.0502	0.0002
620.98	1.12	0.82	0.9361	0.0503	0.0002
620.97	1.12	0.81	0.9364	0.0503	0.0002
620.96	1.12	0.80	0.9367	0.0504	0.0002
620.95	1.12	0.80	0.9370	0.0504	0.0002
620.94	1.11	0.79	0.9374	0.0505	0.0002
620.93	1.11	0.78	0.9377	0.0505	0.0002
620.92	1.11	0.77	0.9380	0.0505	0.0002
620.91	1.11	0.76	0.9383	0.0505	0.0002
620.90	1.11	0.76	0.9387	0.0506	0.0002
620.89	1.10	0.75	0.9390	0.0506	0.0002
620.88	1.10	0.74	0.9393	0.0506	0.0002
620.87	1.10	0.73	0.9396	0.0506	0.0002
620.86	1.10	0.72	0.9399	0.0506	0.0002
620.85	1.10	0.72	0.9403	0.0506	0.0002
620.84	1.09	0.71	0.9406	0.0505	0.0002
620.83	1.09	0.70	0.9409	0.0505	0.0002
620.82	1.09	0.69	0.9412	0.0505	0.0002
620.81	1.09	0.69	0.9415	0.0504	0.0002
620.80	1.09	0.68	0.9418	0.0504	0.0002
620.79	1.08	0.67	0.9421	0.0504	0.0002
620.78	1.08	0.66	0.9425	0.0503	0.0002
620.77	1.08	0.65	0.9428	0.0503	0.0002
620.76	1.08	0.65	0.9431	0.0502	0.0002
620.75	1.08	0.64	0.9434	0.0501	0.0002
620.74	1.07	0.63	0.9437	0.0501	0.0002
620.73	1.07	0.62	0.9440	0.0500	0.0002
620.72	1.07	0.61	0.9443	0.0499	0.0002
620.71	1.07	0.61	0.9446	0.0498	0.0002
620.70	1.06	0.60	0.9449	0.0497	0.0002
620.69	1.06	0.59	0.9452	0.0496	0.0002
620.68	1.06	0.58	0.9455	0.0495	0.0002
620.67	1.06	0.57	0.9458	0.0494	0.0002
620.66	1.06	0.57	0.9461	0.0493	0.0002
620.65	1.05	0.56	0.9464	0.0492	0.0002
620.64	1.05	0.55	0.9467	0.0491	0.0002
620.63	1.05	0.54	0.9470	0.0490	0.0002
620.62	1.05	0.53	0.9473	0.0489	0.0002

620.61	1.05	0.53	0.9476	0.0487	0.0002
620.60	1.04	0.52	0.9479	0.0486	0.0002
620.59	1.04	0.51	0.9482	0.0485	0.0002
620.58	1.04	0.50	0.9485	0.0483	0.0002
620.57	1.04	0.50	0.9488	0.0482	0.0002
620.56	1.04	0.49	0.9490	0.0480	0.0002
620.55	1.03	0.48	0.9493	0.0479	0.0002
620.54	1.03	0.47	0.9496	0.0477	0.0002
620.53	1.03	0.46	0.9499	0.0476	0.0002
620.52	1.03	0.46	0.9502	0.0474	0.0002
620.51	1.02	0.45	0.9505	0.0473	0.0002
620.50	1.02	0.44	0.9508	0.0471	0.0002
620.49	1.02	0.43	0.9511	0.0469	0.0002
620.48	1.02	0.42	0.9513	0.0467	0.0002
620.47	1.02	0.42	0.9516	0.0466	0.0002
620.46	1.01	0.41	0.9519	0.0464	0.0002
620.45	1.01	0.40	0.9522	0.0462	0.0002
620.44	1.01	0.39	0.9525	0.0460	0.0002
620.43	1.01	0.38	0.9527	0.0458	0.0002
620.42	1.01	0.38	0.9530	0.0456	0.0002
620.41	1.00	0.37	0.9533	0.0454	0.0002
620.40	1.00	0.36	0.9536	0.0453	0.0002
620.39	1.00	0.35	0.9538	0.0451	0.0002
620.38	1.00	0.35	0.9541	0.0449	0.0002
620.37	1.00	0.34	0.9544	0.0447	0.0002
620.36	0.99	0.33	0.9547	0.0444	0.0002
620.35	0.99	0.32	0.9549	0.0442	0.0002
620.34	0.99	0.31	0.9552	0.0440	0.0002
620.33	0.99	0.31	0.9555	0.0438	0.0002
620.32	0.98	0.30	0.9557	0.0436	0.0002
620.31	0.98	0.29	0.9560	0.0434	0.0002
620.30	0.98	0.28	0.9563	0.0432	0.0002
620.29	0.98	0.27	0.9565	0.0430	0.0002
620.28	0.98	0.27	0.9568	0.0427	0.0002
620.27	0.97	0.26	0.9571	0.0425	0.0002
620.26	0.97	0.25	0.9573	0.0423	0.0002
620.25	0.97	0.24	0.9576	0.0421	0.0002
620.24	0.97	0.23	0.9578	0.0418	0.0002
620.23	0.97	0.23	0.9581	0.0416	0.0002
620.22	0.96	0.22	0.9584	0.0414	0.0002
620.21	0.96	0.21	0.9586	0.0412	0.0002
620.20	0.96	0.20	0.9589	0.0409	0.0002
620.19	0.96	0.20	0.9591	0.0407	0.0002
620.18	0.96	0.19	0.9594	0.0405	0.0002
620.17	0.95	0.18	0.9596	0.0402	0.0002
620.16	0.95	0.17	0.9599	0.0400	0.0002
620.15	0.95	0.16	0.9601	0.0398	0.0002
620.14	0.95	0.16	0.9604	0.0395	0.0002
620.13	0.95	0.15	0.9606	0.0393	0.0002
620.12	0.94	0.14	0.9609	0.0391	0.0002
620.11	0.94	0.13	0.9611	0.0388	0.0002
620.10	0.94	0.12	0.9614	0.0386	0.0002
620.09	0.94	0.12	0.9616	0.0383	0.0002
620.08	0.93	0.11	0.9619	0.0381	0.0002
620.07	0.93	0.10	0.9621	0.0379	0.0002
620.06	0.93	0.09	0.9624	0.0376	0.0002
620.05	0.93	0.08	0.9626	0.0374	0.0002
620.04	0.93	0.08	0.9628	0.0372	0.0002
620.03	0.92	0.07	0.9631	0.0369	0.0002
620.02	0.92	0.06	0.9633	0.0367	0.0002
620.01	0.92	0.05	0.9636	0.0364	0.0002
620.00	0.92	0.04	0.9638	0.0362	0.0002
619.99	0.92	0.04	0.9640	0.0360	0.0002
619.98	0.91	0.03	0.9643	0.0357	0.0002
619.97	0.91	0.02	0.9645	0.0355	0.0002
619.96	0.91	0.01	0.9647	0.0353	0.0002
619.95	0.91	0.01	0.9650	0.0350	0.0002
619.94	0.91	0.00	0.9652	0.0348	0.0002
619.93	0.90	0.00	0.9654	0.0346	0.0002
619.92	0.90	0.00	0.9657	0.0343	0.0002
619.91	0.90	0.00	0.9659	0.0341	0.0001
619.90	0.90	0.00	0.9661	0.0339	0.0001
619.89	0.89	0.00	0.9663	0.0337	0.0001
619.88	0.89	0.00	0.9666	0.0334	0.0001
619.87	0.89	0.00	0.9668	0.0332	0.0001
619.86	0.89	0.00	0.9670	0.0330	0.0001
619.85	0.89	0.00	0.9672	0.0328	0.0001
619.84	0.88	0.00	0.9675	0.0325	0.0001
619.83	0.88	0.00	0.9677	0.0323	0.0001

619.82	0.88	0.00	0.9679	0.0321	0.0001
619.81	0.88	0.00	0.9681	0.0319	0.0001
619.80	0.88	0.00	0.9683	0.0317	0.0001
619.79	0.87	0.00	0.9686	0.0314	0.0001
619.78	0.87	0.00	0.9688	0.0312	0.0001
619.77	0.87	0.00	0.9690	0.0310	0.0001
619.76	0.87	0.00	0.9692	0.0308	0.0001
619.75	0.87	0.00	0.9694	0.0306	0.0001
619.74	0.86	0.00	0.9696	0.0304	0.0001
619.73	0.86	0.00	0.9698	0.0302	0.0001
619.72	0.86	0.00	0.9701	0.0299	0.0001
619.71	0.86	0.00	0.9703	0.0297	0.0001
619.70	0.85	0.00	0.9705	0.0295	0.0001
619.69	0.85	0.00	0.9707	0.0293	0.0001
619.68	0.85	0.00	0.9709	0.0291	0.0001
619.67	0.85	0.00	0.9711	0.0289	0.0001
619.66	0.85	0.00	0.9713	0.0287	0.0001
619.65	0.84	0.00	0.9715	0.0285	0.0001
619.64	0.84	0.00	0.9717	0.0283	0.0001
619.63	0.84	0.00	0.9719	0.0281	0.0001
619.62	0.84	0.00	0.9721	0.0279	0.0001
619.61	0.84	0.00	0.9723	0.0277	0.0001
619.60	0.83	0.00	0.9725	0.0275	0.0001
619.59	0.83	0.00	0.9727	0.0273	0.0001
619.58	0.83	0.00	0.9729	0.0271	0.0001
619.57	0.83	0.00	0.9731	0.0269	0.0001
619.56	0.83	0.00	0.9733	0.0267	0.0001
619.55	0.82	0.00	0.9735	0.0265	0.0001
619.54	0.82	0.00	0.9737	0.0263	0.0001
619.53	0.82	0.00	0.9739	0.0261	0.0001
619.52	0.82	0.00	0.9741	0.0259	0.0001
619.51	0.82	0.00	0.9743	0.0257	0.0001
619.50	0.81	0.00	0.9745	0.0255	0.0001
619.49	0.81	0.00	0.9747	0.0253	0.0001
619.48	0.81	0.00	0.9749	0.0251	0.0001
619.47	0.81	0.00	0.9751	0.0249	0.0001
619.46	0.80	0.00	0.9752	0.0248	0.0001
619.45	0.80	0.00	0.9754	0.0246	0.0001
619.44	0.80	0.00	0.9756	0.0244	0.0001
619.43	0.80	0.00	0.9758	0.0242	0.0001
619.42	0.80	0.00	0.9760	0.0240	0.0001
619.41	0.79	0.00	0.9762	0.0238	0.0001
619.40	0.79	0.00	0.9764	0.0236	0.0001
619.39	0.79	0.00	0.9765	0.0235	0.0001
619.38	0.79	0.00	0.9767	0.0233	0.0001
619.37	0.79	0.00	0.9769	0.0231	0.0001
619.36	0.78	0.00	0.9771	0.0229	0.0001
619.35	0.78	0.00	0.9773	0.0227	0.0001
619.34	0.78	0.00	0.9774	0.0226	0.0001
619.33	0.78	0.00	0.9776	0.0224	0.0001
619.32	0.78	0.00	0.9778	0.0222	0.0001
619.31	0.77	0.00	0.9780	0.0220	0.0001
619.30	0.77	0.00	0.9781	0.0219	0.0001
619.29	0.77	0.00	0.9783	0.0217	0.0001
619.28	0.77	0.00	0.9785	0.0215	0.0001
619.27	0.76	0.00	0.9786	0.0214	0.0001
619.26	0.76	0.00	0.9788	0.0212	0.0001
619.25	0.76	0.00	0.9790	0.0210	0.0001
619.24	0.76	0.00	0.9792	0.0208	0.0001
619.23	0.76	0.00	0.9793	0.0207	0.0001
619.22	0.75	0.00	0.9795	0.0205	0.0001
619.21	0.75	0.00	0.9797	0.0203	0.0001
619.20	0.75	0.00	0.9798	0.0202	0.0001
619.19	0.75	0.00	0.9800	0.0200	0.0001
619.18	0.75	0.00	0.9802	0.0198	0.0001
619.17	0.74	0.00	0.9803	0.0197	0.0001
619.16	0.74	0.00	0.9805	0.0195	0.0001
619.15	0.74	0.00	0.9806	0.0194	0.0001
619.14	0.74	0.00	0.9808	0.0192	0.0001
619.13	0.74	0.00	0.9810	0.0190	0.0001
619.12	0.73	0.00	0.9811	0.0189	0.0001
619.11	0.73	0.00	0.9813	0.0187	0.0001
619.10	0.73	0.00	0.9814	0.0186	0.0001
619.09	0.73	0.00	0.9816	0.0184	0.0001
619.08	0.72	0.00	0.9817	0.0183	0.0001
619.07	0.72	0.00	0.9819	0.0181	0.0001
619.06	0.72	0.00	0.9821	0.0179	0.0001
619.05	0.72	0.00	0.9822	0.0178	0.0001
619.04	0.72	0.00	0.9824	0.0176	0.0001

619.03	0.71	0.00	0.9825	0.0175	0.0001
619.02	0.71	0.00	0.9827	0.0173	0.0001
619.01	0.71	0.00	0.9828	0.0172	0.0001
619.00	0.71	0.00	0.9830	0.0170	0.0001
618.99	0.71	0.00	0.9831	0.0169	0.0001
618.98	0.70	0.00	0.9833	0.0167	0.0001
618.97	0.70	0.00	0.9834	0.0166	0.0001
618.96	0.70	0.00	0.9835	0.0165	0.0001
618.95	0.70	0.00	0.9837	0.0163	0.0001
618.94	0.70	0.00	0.9838	0.0162	0.0001
618.93	0.69	0.00	0.9840	0.0160	0.0001
618.92	0.69	0.00	0.9841	0.0159	0.0001
618.91	0.69	0.00	0.9843	0.0157	0.0001
618.90	0.69	0.00	0.9844	0.0156	0.0001
618.89	0.69	0.00	0.9845	0.0155	0.0001
618.88	0.68	0.00	0.9847	0.0153	0.0001
618.87	0.68	0.00	0.9848	0.0152	0.0001
618.86	0.68	0.00	0.9850	0.0150	0.0001
618.85	0.68	0.00	0.9851	0.0149	0.0001
618.84	0.67	0.00	0.9852	0.0148	0.0001
618.83	0.67	0.00	0.9854	0.0146	0.0001
618.82	0.67	0.00	0.9855	0.0145	0.0001
618.81	0.67	0.00	0.9856	0.0144	0.0001
618.80	0.67	0.00	0.9858	0.0142	0.0001
618.79	0.66	0.00	0.9859	0.0141	0.0001
618.78	0.66	0.00	0.9860	0.0140	0.0001
618.77	0.66	0.00	0.9862	0.0138	0.0001
618.76	0.66	0.00	0.9863	0.0137	0.0001
618.75	0.66	0.00	0.9864	0.0136	0.0001
618.74	0.65	0.00	0.9865	0.0135	0.0001
618.73	0.65	0.00	0.9867	0.0133	0.0001
618.72	0.65	0.00	0.9868	0.0132	0.0001
618.71	0.65	0.00	0.9869	0.0131	0.0001
618.70	0.65	0.00	0.9870	0.0130	0.0001
618.69	0.64	0.00	0.9872	0.0128	0.0001
618.68	0.64	0.00	0.9873	0.0127	0.0001
618.67	0.64	0.00	0.9874	0.0126	0.0001
618.66	0.64	0.00	0.9875	0.0125	0.0001
618.65	0.63	0.00	0.9877	0.0123	0.0001
618.64	0.63	0.00	0.9878	0.0122	0.0001
618.63	0.63	0.00	0.9879	0.0121	0.0001
618.62	0.63	0.00	0.9880	0.0120	0.0001
618.61	0.63	0.00	0.9881	0.0119	0.0001
618.60	0.62	0.00	0.9882	0.0118	0.0001
618.59	0.62	0.00	0.9884	0.0116	0.0001
618.58	0.62	0.00	0.9885	0.0115	0.0001
618.57	0.62	0.00	0.9886	0.0114	0.0000
618.56	0.62	0.00	0.9887	0.0113	0.0000
618.55	0.61	0.00	0.9888	0.0112	0.0000
618.54	0.61	0.00	0.9889	0.0111	0.0000
618.53	0.61	0.00	0.9890	0.0110	0.0000
618.52	0.61	0.00	0.9892	0.0108	0.0000
618.51	0.61	0.00	0.9893	0.0107	0.0000
618.50	0.60	0.00	0.9894	0.0106	0.0000
618.49	0.60	0.00	0.9895	0.0105	0.0000
618.48	0.60	0.00	0.9896	0.0104	0.0000
618.47	0.60	0.00	0.9897	0.0103	0.0000
618.46	0.59	0.00	0.9898	0.0102	0.0000
618.45	0.59	0.00	0.9899	0.0101	0.0000
618.44	0.59	0.00	0.9900	0.0100	0.0000
618.43	0.59	0.00	0.9901	0.0099	0.0000
618.42	0.59	0.00	0.9902	0.0098	0.0000
618.41	0.58	0.00	0.9903	0.0097	0.0000
618.40	0.58	0.00	0.9904	0.0096	0.0000
618.39	0.58	0.00	0.9905	0.0095	0.0000
618.38	0.58	0.00	0.9906	0.0094	0.0000
618.37	0.58	0.00	0.9907	0.0093	0.0000
618.36	0.57	0.00	0.9908	0.0092	0.0000
618.35	0.57	0.00	0.9909	0.0091	0.0000
618.34	0.57	0.00	0.9910	0.0090	0.0000
618.33	0.57	0.00	0.9911	0.0089	0.0000
618.32	0.57	0.00	0.9912	0.0088	0.0000
618.31	0.56	0.00	0.9913	0.0087	0.0000
618.30	0.56	0.00	0.9914	0.0086	0.0000
618.29	0.56	0.00	0.9915	0.0085	0.0000
618.28	0.56	0.00	0.9916	0.0084	0.0000
618.27	0.56	0.00	0.9917	0.0083	0.0000
618.26	0.55	0.00	0.9918	0.0082	0.0000
618.25	0.55	0.00	0.9919	0.0081	0.0000

618.24	0.55	0.00	0.9920	0.0080	0.0000
618.23	0.55	0.00	0.9921	0.0079	0.0000
618.22	0.54	0.00	0.9922	0.0078	0.0000
618.21	0.54	0.00	0.9923	0.0077	0.0000
618.20	0.54	0.00	0.9923	0.0077	0.0000
618.19	0.54	0.00	0.9924	0.0076	0.0000
618.18	0.54	0.00	0.9925	0.0075	0.0000
618.17	0.53	0.00	0.9926	0.0074	0.0000
618.16	0.53	0.00	0.9927	0.0073	0.0000
618.15	0.53	0.00	0.9928	0.0072	0.0000
618.14	0.53	0.00	0.9929	0.0071	0.0000
618.13	0.53	0.00	0.9929	0.0071	0.0000
618.12	0.52	0.00	0.9930	0.0070	0.0000
618.11	0.52	0.00	0.9931	0.0069	0.0000
618.10	0.52	0.00	0.9932	0.0068	0.0000
618.09	0.52	0.00	0.9933	0.0067	0.0000
618.08	0.52	0.00	0.9934	0.0066	0.0000
618.07	0.51	0.00	0.9934	0.0066	0.0000
618.06	0.51	0.00	0.9935	0.0065	0.0000
618.05	0.51	0.00	0.9936	0.0064	0.0000
618.04	0.51	0.00	0.9937	0.0063	0.0000
618.03	0.50	0.00	0.9938	0.0062	0.0000
618.02	0.50	0.00	0.9938	0.0062	0.0000
618.01	0.50	0.00	0.9939	0.0061	0.0000
618.00	0.50	0.00	0.9940	0.0060	0.0000
617.99	0.50	0.00	0.9941	0.0059	0.0000
617.98	0.49	0.00	0.9941	0.0059	0.0000
617.97	0.49	0.00	0.9942	0.0058	0.0000
617.96	0.49	0.00	0.9943	0.0057	0.0000
617.95	0.49	0.00	0.9943	0.0057	0.0000
617.94	0.49	0.00	0.9944	0.0056	0.0000
617.93	0.48	0.00	0.9945	0.0055	0.0000
617.92	0.48	0.00	0.9946	0.0054	0.0000
617.91	0.48	0.00	0.9946	0.0054	0.0000
617.90	0.48	0.00	0.9947	0.0053	0.0000
617.89	0.48	0.00	0.9948	0.0052	0.0000
617.88	0.47	0.00	0.9948	0.0052	0.0000
617.87	0.47	0.00	0.9949	0.0051	0.0000
617.86	0.47	0.00	0.9950	0.0050	0.0000
617.85	0.47	0.00	0.9950	0.0050	0.0000
617.84	0.46	0.00	0.9951	0.0049	0.0000
617.83	0.46	0.00	0.9952	0.0048	0.0000
617.82	0.46	0.00	0.9952	0.0048	0.0000
617.81	0.46	0.00	0.9953	0.0047	0.0000
617.80	0.46	0.00	0.9954	0.0046	0.0000
617.79	0.45	0.00	0.9954	0.0046	0.0000
617.78	0.45	0.00	0.9955	0.0045	0.0000
617.77	0.45	0.00	0.9956	0.0044	0.0000
617.76	0.45	0.00	0.9956	0.0044	0.0000
617.75	0.45	0.00	0.9957	0.0043	0.0000
617.74	0.44	0.00	0.9957	0.0043	0.0000
617.73	0.44	0.00	0.9958	0.0042	0.0000
617.72	0.44	0.00	0.9959	0.0041	0.0000
617.71	0.44	0.00	0.9959	0.0041	0.0000
617.70	0.44	0.00	0.9960	0.0040	0.0000
617.69	0.43	0.00	0.9960	0.0040	0.0000
617.68	0.43	0.00	0.9961	0.0039	0.0000
617.67	0.43	0.00	0.9961	0.0039	0.0000
617.66	0.43	0.00	0.9962	0.0038	0.0000
617.65	0.43	0.00	0.9963	0.0037	0.0000
617.64	0.42	0.00	0.9963	0.0037	0.0000
617.63	0.42	0.00	0.9964	0.0036	0.0000
617.62	0.42	0.00	0.9964	0.0036	0.0000
617.61	0.42	0.00	0.9965	0.0035	0.0000
617.60	0.41	0.00	0.9965	0.0035	0.0000
617.59	0.41	0.00	0.9966	0.0034	0.0000
617.58	0.41	0.00	0.9966	0.0034	0.0000
617.57	0.41	0.00	0.9967	0.0033	0.0000
617.56	0.41	0.00	0.9967	0.0033	0.0000
617.55	0.40	0.00	0.9968	0.0032	0.0000
617.54	0.40	0.00	0.9968	0.0032	0.0000
617.53	0.40	0.00	0.9969	0.0031	0.0000
617.52	0.40	0.00	0.9969	0.0031	0.0000
617.51	0.40	0.00	0.9970	0.0030	0.0000
617.50	0.39	0.00	0.9970	0.0030	0.0000
617.49	0.39	0.00	0.9971	0.0029	0.0000
617.48	0.39	0.00	0.9971	0.0029	0.0000
617.47	0.39	0.00	0.9972	0.0028	0.0000
617.46	0.39	0.00	0.9972	0.0028	0.0000

617.45	0.38	0.00	0.9973	0.0027	0.0000
617.44	0.38	0.00	0.9973	0.0027	0.0000
617.43	0.38	0.00	0.9973	0.0027	0.0000
617.42	0.38	0.00	0.9974	0.0026	0.0000
617.41	0.37	0.00	0.9974	0.0026	0.0000
617.40	0.37	0.00	0.9975	0.0025	0.0000
617.39	0.37	0.00	0.9975	0.0025	0.0000
617.38	0.37	0.00	0.9976	0.0024	0.0000
617.37	0.37	0.00	0.9976	0.0024	0.0000
617.36	0.36	0.00	0.9976	0.0024	0.0000
617.35	0.36	0.00	0.9977	0.0023	0.0000
617.34	0.36	0.00	0.9977	0.0023	0.0000
617.33	0.36	0.00	0.9978	0.0022	0.0000
617.32	0.36	0.00	0.9978	0.0022	0.0000
617.31	0.35	0.00	0.9978	0.0022	0.0000
617.30	0.35	0.00	0.9979	0.0021	0.0000
617.29	0.35	0.00	0.9979	0.0021	0.0000
617.28	0.35	0.00	0.9980	0.0020	0.0000
617.27	0.35	0.00	0.9980	0.0020	0.0000
617.26	0.34	0.00	0.9980	0.0020	0.0000
617.25	0.34	0.00	0.9981	0.0019	0.0000
617.24	0.34	0.00	0.9981	0.0019	0.0000
617.23	0.34	0.00	0.9981	0.0019	0.0000
617.22	0.33	0.00	0.9982	0.0018	0.0000
617.21	0.33	0.00	0.9982	0.0018	0.0000
617.20	0.33	0.00	0.9982	0.0018	0.0000
617.19	0.33	0.00	0.9983	0.0017	0.0000
617.18	0.33	0.00	0.9983	0.0017	0.0000
617.17	0.32	0.00	0.9983	0.0017	0.0000
617.16	0.32	0.00	0.9984	0.0016	0.0000
617.15	0.32	0.00	0.9984	0.0016	0.0000
617.14	0.32	0.00	0.9984	0.0016	0.0000
617.13	0.32	0.00	0.9985	0.0015	0.0000
617.12	0.31	0.00	0.9985	0.0015	0.0000
617.11	0.31	0.00	0.9985	0.0015	0.0000
617.10	0.31	0.00	0.9986	0.0014	0.0000
617.09	0.31	0.00	0.9986	0.0014	0.0000
617.08	0.31	0.00	0.9986	0.0014	0.0000
617.07	0.30	0.00	0.9986	0.0014	0.0000
617.06	0.30	0.00	0.9987	0.0013	0.0000
617.05	0.30	0.00	0.9987	0.0013	0.0000
617.04	0.30	0.00	0.9987	0.0013	0.0000
617.03	0.30	0.00	0.9987	0.0013	0.0000
617.02	0.29	0.00	0.9988	0.0012	0.0000
617.01	0.29	0.00	0.9988	0.0012	0.0000
617.00	0.29	0.00	0.9988	0.0012	0.0000
616.99	0.29	0.00	0.9989	0.0011	0.0000
616.98	0.28	0.00	0.9989	0.0011	0.0000
616.97	0.28	0.00	0.9989	0.0011	0.0000
616.96	0.28	0.00	0.9989	0.0011	0.0000
616.95	0.28	0.00	0.9989	0.0011	0.0000
616.94	0.28	0.00	0.9990	0.0010	0.0000
616.93	0.27	0.00	0.9990	0.0010	0.0000
616.92	0.27	0.00	0.9990	0.0010	0.0000
616.91	0.27	0.00	0.9990	0.0010	0.0000
616.90	0.27	0.00	0.9991	0.0009	0.0000
616.89	0.27	0.00	0.9991	0.0009	0.0000
616.88	0.26	0.00	0.9991	0.0009	0.0000
616.87	0.26	0.00	0.9991	0.0009	0.0000
616.86	0.26	0.00	0.9991	0.0009	0.0000
616.85	0.26	0.00	0.9992	0.0008	0.0000
616.84	0.26	0.00	0.9992	0.0008	0.0000
616.83	0.25	0.00	0.9992	0.0008	0.0000
616.82	0.25	0.00	0.9992	0.0008	0.0000
616.81	0.25	0.00	0.9992	0.0008	0.0000
616.80	0.25	0.00	0.9993	0.0007	0.0000
616.79	0.24	0.00	0.9993	0.0007	0.0000
616.78	0.24	0.00	0.9993	0.0007	0.0000
616.77	0.24	0.00	0.9993	0.0007	0.0000
616.76	0.24	0.00	0.9993	0.0007	0.0000
616.75	0.24	0.00	0.9994	0.0006	0.0000
616.74	0.23	0.00	0.9994	0.0006	0.0000
616.73	0.23	0.00	0.9994	0.0006	0.0000
616.72	0.23	0.00	0.9994	0.0006	0.0000
616.71	0.23	0.00	0.9994	0.0006	0.0000
616.70	0.23	0.00	0.9994	0.0006	0.0000
616.69	0.22	0.00	0.9995	0.0005	0.0000
616.68	0.22	0.00	0.9995	0.0005	0.0000
616.67	0.22	0.00	0.9995	0.0005	0.0000





	615.87	0.05	0.00	1.0000	0.0000	0.0000
	615.86	0.05	0.00	1.0000	0.0000	0.0000
	615.85	0.05	0.00	1.0000	0.0000	0.0000
	615.84	0.05	0.00	1.0000	0.0000	0.0000
	615.83	0.04	0.00	1.0000	0.0000	0.0000
	615.82	0.04	0.00	1.0000	0.0000	0.0000
	615.81	0.04	0.00	1.0000	0.0000	0.0000
	615.80	0.04	0.00	1.0000	0.0000	0.0000
	615.79	0.04	0.00	1.0000	0.0000	0.0000
	615.78	0.03	0.00	1.0000	0.0000	0.0000
	615.77	0.03	0.00	1.0000	0.0000	0.0000
	615.76	0.03	0.00	1.0000	0.0000	0.0000
	615.75	0.03	0.00	1.0000	0.0000	0.0000
	615.74	0.02	0.00	1.0000	0.0000	0.0000
	615.73	0.02	0.00	1.0000	0.0000	0.0000
	615.72	0.02	0.00	1.0000	0.0000	0.0000
	615.71	0.02	0.00	1.0000	0.0000	0.0000
	615.70	0.02	0.00	1.0000	0.0000	0.0000
	615.69	0.01	0.00	1.0000	0.0000	0.0000
	615.68	0.01	0.00	1.0000	0.0000	0.0000
	615.67	0.01	0.00	1.0000	0.0000	0.0000
	615.66	0.01	0.00	1.0000	0.0000	0.0000
	615.65	0.01	0.00	1.0000	0.0000	0.0000
	615.64	0.00	0.00	1.0000	0.0000	0.0000
	615.63	0.00	0.00	1.0000	0.0000	0.0000
Zow =	615.62	0.00	0.00	1.0000	0.0000	0.0000

Oil Specific Volume      0.0529    ft<sup>3</sup>/ft<sup>2</sup>

Data Entry Worksheet for Soil Samples -- Oil Specific Volume (OSV) Calculations

Project No. = 406   = User must enter the soil or fluid parameter, or lab data, as appropriate  
 Boring Designation = MW-25

Soil Parameters

Fluid Parameters

Oil Parameters

Required to Estimate OSV - Soil

Required to Estimate OSV - Soil

$\rho_b = 1.5 \text{ g/cm}^3$  Bulk density of soil

$\rho_o = 0.772 \text{ g/cm}^3$  Oil density

Soil Sample Data

Sample Intervals (maximum 21 samples)

	Feet (bgs)	to	Feet (bgs)	GRO or DRO (mg/kg)
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				

Deepest sample must be entered in this row

## Data Entry Worksheet for Monitoring Well Fluid Data -- Oil Specific Volume (OSV) Calculations

Project No. = 406  
Boring Designation = MW-25

= User must enter the soil or fluid parameter, or lab data, as appropriate

### Soil Parameters

#### Required to Estimate OSV - MWs

$\phi$  = 0.437 Total porosity

$\sigma_{ow}$  = 24.1 dynes/cm Oil/Water Interfacial Tension

$\sigma_{ao}$  = 22.6 dynes/cm Air/Oil Surface Tension

$\sigma_{aw}$  = 65.5 dynes/cm Air/Water Surface Tension

$\alpha$  = 0.125 /foot Van Genuchten mean pore-size parameter

$n$  = 3.00500 Van Genuchten pore-size distribution exponent

$S_m$  = 0.046 Irreducible water saturation

### Fluid Parameters

$\rho_{ro}$  = 0.772 Ratio of oil to water density

$\beta_{ao}$  = 2.90 Ratio of water surface tension to oil surface tension

$\beta_{ow}$  = 2.72 Ratio of water surface tension to oil-water interfacial tension

$Z_{ow}$  = 21.76 feet Depth to oil/air interface

$Z_{ao}$  = 24.08 feet Depth to oil/water interface

$S_m$  = 0.046 Water saturation at field capacity

$\alpha$  = 0.125 /foot Van Genuchten mean pore-size parameter

$n$  = 3.00500 Van Genuchten pore-size distribution exponent

$m$  = 0.334443 Calculated from "n" (Burdine)

$dZ$  = 0.01 feet Integration increment (0.01 to 1.0)

TOC = 637.7 feet Elevation of TOC or measuring point



Oil Specific Volume Calculation Spreadsheet for Free-phase Hydrocarbon in Monitoring Wells

Project No. 406  
 Boring Designation MW-25

**DO NOT CHANGE ANY CELLS ON THIS WORKSHEET**

Z (feet)	h <sub>ow</sub> (feet)	h <sub>ao</sub> (feet)	S <sub>w</sub> (-)	S <sub>of</sub> (-)	φ S <sub>of</sub> dZ (ft <sup>3</sup> /ft <sup>2</sup> )
Z <sub>u</sub> = 616.83	0.73	0.69	0.9904	0.0000	0.0000
616.82	0.73	0.68	0.9905	0.0002	0.0000
616.81	0.73	0.67	0.9906	0.0004	0.0000
616.80	0.72	0.66	0.9907	0.0007	0.0000
616.79	0.72	0.66	0.9908	0.0009	0.0000
616.78	0.72	0.65	0.9909	0.0011	0.0000
616.77	0.72	0.64	0.9909	0.0013	0.0000
616.76	0.72	0.63	0.9910	0.0015	0.0000
616.75	0.71	0.62	0.9911	0.0017	0.0000
616.74	0.71	0.62	0.9912	0.0018	0.0000
616.73	0.71	0.61	0.9913	0.0020	0.0000
616.72	0.71	0.60	0.9914	0.0022	0.0000
616.71	0.70	0.59	0.9914	0.0023	0.0000
616.70	0.70	0.59	0.9915	0.0025	0.0000
616.69	0.70	0.58	0.9916	0.0026	0.0000
616.68	0.70	0.57	0.9917	0.0028	0.0000
616.67	0.70	0.56	0.9918	0.0029	0.0000
616.66	0.69	0.55	0.9918	0.0031	0.0000
616.65	0.69	0.55	0.9919	0.0032	0.0000
616.64	0.69	0.54	0.9920	0.0033	0.0000
616.63	0.69	0.53	0.9921	0.0034	0.0000
616.62	0.68	0.52	0.9922	0.0035	0.0000
616.61	0.68	0.52	0.9922	0.0037	0.0000
616.60	0.68	0.51	0.9923	0.0038	0.0000
616.59	0.68	0.50	0.9924	0.0039	0.0000
616.58	0.67	0.49	0.9925	0.0040	0.0000
616.57	0.67	0.49	0.9925	0.0040	0.0000
616.56	0.67	0.48	0.9926	0.0041	0.0000
616.55	0.67	0.47	0.9927	0.0042	0.0000
616.54	0.67	0.46	0.9928	0.0043	0.0000
616.53	0.66	0.45	0.9928	0.0044	0.0000
616.52	0.66	0.45	0.9929	0.0044	0.0000
616.51	0.66	0.44	0.9930	0.0045	0.0000
616.50	0.66	0.43	0.9931	0.0045	0.0000
616.49	0.65	0.42	0.9931	0.0046	0.0000
616.48	0.65	0.42	0.9932	0.0046	0.0000
616.47	0.65	0.41	0.9933	0.0047	0.0000
616.46	0.65	0.40	0.9933	0.0047	0.0000
616.45	0.64	0.39	0.9934	0.0048	0.0000
616.44	0.64	0.38	0.9935	0.0048	0.0000
616.43	0.64	0.38	0.9936	0.0048	0.0000
616.42	0.64	0.37	0.9936	0.0049	0.0000
616.41	0.64	0.36	0.9937	0.0049	0.0000
616.40	0.63	0.35	0.9938	0.0049	0.0000
616.39	0.63	0.35	0.9938	0.0049	0.0000
616.38	0.63	0.34	0.9939	0.0050	0.0000
616.37	0.63	0.33	0.9940	0.0050	0.0000
616.36	0.62	0.32	0.9940	0.0050	0.0000
616.35	0.62	0.32	0.9941	0.0050	0.0000
616.34	0.62	0.31	0.9941	0.0050	0.0000
616.33	0.62	0.30	0.9942	0.0050	0.0000
616.32	0.62	0.29	0.9943	0.0050	0.0000
616.31	0.61	0.28	0.9943	0.0050	0.0000
616.30	0.61	0.28	0.9944	0.0050	0.0000
616.29	0.61	0.27	0.9945	0.0050	0.0000
616.28	0.61	0.26	0.9945	0.0049	0.0000
616.27	0.60	0.25	0.9946	0.0049	0.0000
616.26	0.60	0.25	0.9946	0.0049	0.0000
616.25	0.60	0.24	0.9947	0.0049	0.0000
616.24	0.60	0.23	0.9948	0.0049	0.0000
616.23	0.59	0.22	0.9948	0.0048	0.0000
616.22	0.59	0.22	0.9949	0.0048	0.0000
616.21	0.59	0.21	0.9949	0.0048	0.0000
616.20	0.59	0.20	0.9950	0.0048	0.0000
616.19	0.59	0.19	0.9951	0.0047	0.0000
616.18	0.58	0.18	0.9951	0.0047	0.0000
616.17	0.58	0.18	0.9952	0.0047	0.0000
616.16	0.58	0.17	0.9952	0.0046	0.0000

$$Z_u = \rho_{ro} \beta_{ao} H_o / [\rho_{ro} \beta_{ao} - (1 - \rho_{ro}) \beta_{ow}]$$

$$= 616.83 \text{ feet}$$

where:

$$\rho_{ro} = 0.772$$

$$\beta_{ao} = 2.90$$

$$\beta_{ow} = 2.72$$

$$H_o = 2.32 \text{ feet}$$

$$Z_{ow} = 613.62 \text{ feet}$$

$$Z_{ao} = 615.94 \text{ feet}$$

Other parameters used in calculations (from Data Entry - MWs)

$$S_m = 0.046$$

$$\alpha = 0.125 \text{ /foot}$$

$$n = 3.005$$

$$m = 0.334442596$$

$$dZ = 0.01 \text{ feet} \quad \text{Integration increment (0.01 to 1.0)}$$

$$\phi = 0.437$$

Oil Specific Volume

$$\Sigma \phi S_{of} dZ = 2.4389E-03 \text{ ft}^3/\text{ft}^2 \quad \text{Oil Specific Volume}$$

616.15	0.58	0.16	0.9953	0.0046	0.0000
616.14	0.57	0.15	0.9953	0.0046	0.0000
616.13	0.57	0.15	0.9954	0.0045	0.0000
616.12	0.57	0.14	0.9955	0.0045	0.0000
616.11	0.57	0.13	0.9955	0.0044	0.0000
616.10	0.57	0.12	0.9956	0.0044	0.0000
616.09	0.56	0.11	0.9956	0.0043	0.0000
616.08	0.56	0.11	0.9957	0.0043	0.0000
616.07	0.56	0.10	0.9957	0.0043	0.0000
616.06	0.56	0.09	0.9958	0.0042	0.0000
616.05	0.55	0.08	0.9958	0.0042	0.0000
616.04	0.55	0.08	0.9959	0.0041	0.0000
616.03	0.55	0.07	0.9959	0.0041	0.0000
616.02	0.55	0.06	0.9960	0.0040	0.0000
616.01	0.54	0.05	0.9960	0.0040	0.0000
616.00	0.54	0.05	0.9961	0.0039	0.0000
615.99	0.54	0.04	0.9961	0.0039	0.0000
615.98	0.54	0.03	0.9962	0.0038	0.0000
615.97	0.54	0.02	0.9962	0.0038	0.0000
615.96	0.53	0.01	0.9963	0.0037	0.0000
615.95	0.53	0.01	0.9963	0.0037	0.0000
615.94	0.53	0.00	0.9964	0.0036	0.0000
615.93	0.53	0.00	0.9964	0.0036	0.0000
615.92	0.52	0.00	0.9965	0.0035	0.0000
615.91	0.52	0.00	0.9965	0.0035	0.0000
615.90	0.52	0.00	0.9965	0.0035	0.0000
615.89	0.52	0.00	0.9966	0.0034	0.0000
615.88	0.51	0.00	0.9966	0.0034	0.0000
615.87	0.51	0.00	0.9967	0.0033	0.0000
615.86	0.51	0.00	0.9967	0.0033	0.0000
615.85	0.51	0.00	0.9968	0.0032	0.0000
615.84	0.51	0.00	0.9968	0.0032	0.0000
615.83	0.50	0.00	0.9969	0.0031	0.0000
615.82	0.50	0.00	0.9969	0.0031	0.0000
615.81	0.50	0.00	0.9969	0.0031	0.0000
615.80	0.50	0.00	0.9970	0.0030	0.0000
615.79	0.49	0.00	0.9970	0.0030	0.0000
615.78	0.49	0.00	0.9971	0.0029	0.0000
615.77	0.49	0.00	0.9971	0.0029	0.0000
615.76	0.49	0.00	0.9971	0.0029	0.0000
615.75	0.49	0.00	0.9972	0.0028	0.0000
615.74	0.48	0.00	0.9972	0.0028	0.0000
615.73	0.48	0.00	0.9973	0.0027	0.0000
615.72	0.48	0.00	0.9973	0.0027	0.0000
615.71	0.48	0.00	0.9973	0.0027	0.0000
615.70	0.47	0.00	0.9974	0.0026	0.0000
615.69	0.47	0.00	0.9974	0.0026	0.0000
615.68	0.47	0.00	0.9975	0.0025	0.0000
615.67	0.47	0.00	0.9975	0.0025	0.0000
615.66	0.46	0.00	0.9975	0.0025	0.0000
615.65	0.46	0.00	0.9976	0.0024	0.0000
615.64	0.46	0.00	0.9976	0.0024	0.0000
615.63	0.46	0.00	0.9976	0.0024	0.0000
615.62	0.46	0.00	0.9977	0.0023	0.0000
615.61	0.45	0.00	0.9977	0.0023	0.0000
615.60	0.45	0.00	0.9977	0.0023	0.0000
615.59	0.45	0.00	0.9978	0.0022	0.0000
615.58	0.45	0.00	0.9978	0.0022	0.0000
615.57	0.44	0.00	0.9978	0.0022	0.0000
615.56	0.44	0.00	0.9979	0.0021	0.0000
615.55	0.44	0.00	0.9979	0.0021	0.0000
615.54	0.44	0.00	0.9979	0.0021	0.0000
615.53	0.44	0.00	0.9980	0.0020	0.0000
615.52	0.43	0.00	0.9980	0.0020	0.0000
615.51	0.43	0.00	0.9980	0.0020	0.0000
615.50	0.43	0.00	0.9981	0.0019	0.0000
615.49	0.43	0.00	0.9981	0.0019	0.0000
615.48	0.42	0.00	0.9981	0.0019	0.0000
615.47	0.42	0.00	0.9982	0.0018	0.0000
615.46	0.42	0.00	0.9982	0.0018	0.0000
615.45	0.42	0.00	0.9982	0.0018	0.0000
615.44	0.41	0.00	0.9982	0.0018	0.0000
615.43	0.41	0.00	0.9983	0.0017	0.0000
615.42	0.41	0.00	0.9983	0.0017	0.0000
615.41	0.41	0.00	0.9983	0.0017	0.0000
615.40	0.41	0.00	0.9984	0.0016	0.0000
615.39	0.40	0.00	0.9984	0.0016	0.0000
615.38	0.40	0.00	0.9984	0.0016	0.0000
615.37	0.40	0.00	0.9984	0.0016	0.0000









Data Entry Worksheet for Soil Samples -- Oil Specific Volume (OSV) Calculations

Project No. = 406   = User must enter the soil or fluid parameter, or lab data, as appropriate  
 Boring Designation = MW-26

Soil Parameters

Fluid Parameters

Oil Parameters

Required to Estimate OSV - Soil

Required to Estimate OSV - Soil

$\rho_b = 1.5 \text{ g/cm}^3$  Bulk density of soil

$\rho_o = 0.772 \text{ g/cm}^3$  Oil density

Soil Sample Data

Sample Intervals (maximum 21 samples)

	Feet (bgs)	to	Feet (bgs)	GRO or DRO (mg/kg)
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				

Deepest sample must be entered in this row

## Data Entry Worksheet for Monitoring Well Fluid Data -- Oil Specific Volume (OSV) Calculations

Project No. = 406  
Boring Designation = MW-26

[ ] = User must enter the soil or fluid parameter, or lab data, as appropriate

### Soil Parameters

#### Required to Estimate OSV - MWs

$\phi$  = 0.437 Total porosity

$\sigma_{ow}$  = 24.1 dynes/cm Oil/Water Interfacial Tension

$\sigma_{ao}$  = 22.6 dynes/cm Air/Oil Surface Tension

$\sigma_{aw}$  = 65.5 dynes/cm Air/Water Surface Tension

$\alpha$  = 0.125 /foot Van Genuchten mean pore-size parameter

$n$  = 3.00500 Van Genuchten pore-size distribution exponent

$S_m$  = 0.046 Irreducible water saturation

### Fluid Parameters

$\rho_{ro}$  = 0.772 Ratio of oil to water density

$\beta_{ao}$  = 2.90 Ratio of water surface tension to oil surface tension

$\beta_{ow}$  = 2.72 Ratio of water surface tension to oil-water interfacial tension

$Z_{ow}$  = 20.68 feet Depth to oil/air interface

$Z_{ao}$  = 23.41 feet Depth to oil/water interface

$S_m$  = 0.046 Water saturation at field capacity

$\alpha$  = 0.125 /foot Van Genuchten mean pore-size parameter

$n$  = 3.00500 Van Genuchten pore-size distribution exponent

$m$  = 0.334443 Calculated from "n" (Burdine)

$dZ$  = 0.01 feet Integration increment (0.01 to 1.0)

TOC = 636.11 feet Elevation of TOC or measuring point



Oil Specific Volume Calculation Spreadsheet for Free-phase Hydrocarbon in Monitoring Wells

Project No. 406  
 Boring Designation MW-26

**DO NOT CHANGE ANY CELLS ON THIS WORKSHEET**

Z (feet)	$h_{ow}$ (feet)	$h_{ao}$ (feet)	$S_w$ (-)	$S_{of}$ (-)	$\phi S_{of} dZ$ (ft <sup>3</sup> /ft <sup>2</sup> )
Z <sub>u</sub> = 616.48	0.86	0.81	0.9845	0.0000	0.0000
616.47	0.86	0.80	0.9846	0.0003	0.0000
616.46	0.86	0.79	0.9847	0.0006	0.0000
616.45	0.85	0.78	0.9849	0.0009	0.0000
616.44	0.85	0.78	0.9850	0.0012	0.0000
616.43	0.85	0.77	0.9851	0.0015	0.0000
616.42	0.85	0.76	0.9852	0.0018	0.0000
616.41	0.84	0.75	0.9853	0.0020	0.0000
616.40	0.84	0.75	0.9854	0.0023	0.0000
616.39	0.84	0.74	0.9856	0.0026	0.0000
616.38	0.84	0.73	0.9857	0.0028	0.0000
616.37	0.84	0.72	0.9858	0.0030	0.0000
616.36	0.83	0.71	0.9859	0.0033	0.0000
616.35	0.83	0.71	0.9860	0.0035	0.0000
616.34	0.83	0.70	0.9861	0.0037	0.0000
616.33	0.83	0.69	0.9862	0.0039	0.0000
616.32	0.82	0.68	0.9864	0.0042	0.0000
616.31	0.82	0.68	0.9865	0.0044	0.0000
616.30	0.82	0.67	0.9866	0.0046	0.0000
616.29	0.82	0.66	0.9867	0.0047	0.0000
616.28	0.82	0.65	0.9868	0.0049	0.0000
616.27	0.81	0.65	0.9869	0.0051	0.0000
616.26	0.81	0.64	0.9870	0.0053	0.0000
616.25	0.81	0.63	0.9871	0.0055	0.0000
616.24	0.81	0.62	0.9872	0.0056	0.0000
616.23	0.80	0.61	0.9873	0.0058	0.0000
616.22	0.80	0.61	0.9874	0.0059	0.0000
616.21	0.80	0.60	0.9875	0.0061	0.0000
616.20	0.80	0.59	0.9876	0.0062	0.0000
616.19	0.79	0.58	0.9878	0.0063	0.0000
616.18	0.79	0.58	0.9879	0.0065	0.0000
616.17	0.79	0.57	0.9880	0.0066	0.0000
616.16	0.79	0.56	0.9881	0.0067	0.0000
616.15	0.79	0.55	0.9882	0.0068	0.0000
616.14	0.78	0.54	0.9883	0.0069	0.0000
616.13	0.78	0.54	0.9884	0.0070	0.0000
616.12	0.78	0.53	0.9885	0.0071	0.0000
616.11	0.78	0.52	0.9886	0.0072	0.0000
616.10	0.77	0.51	0.9887	0.0073	0.0000
616.09	0.77	0.51	0.9888	0.0074	0.0000
616.08	0.77	0.50	0.9889	0.0074	0.0000
616.07	0.77	0.49	0.9890	0.0075	0.0000
616.06	0.77	0.48	0.9891	0.0076	0.0000
616.05	0.76	0.48	0.9892	0.0076	0.0000
616.04	0.76	0.47	0.9892	0.0077	0.0000
616.03	0.76	0.46	0.9893	0.0078	0.0000
616.02	0.76	0.45	0.9894	0.0078	0.0000
616.01	0.75	0.44	0.9895	0.0078	0.0000
616.00	0.75	0.44	0.9896	0.0079	0.0000
615.99	0.75	0.43	0.9897	0.0079	0.0000
615.98	0.75	0.42	0.9898	0.0080	0.0000
615.97	0.74	0.41	0.9899	0.0080	0.0000
615.96	0.74	0.41	0.9900	0.0080	0.0000
615.95	0.74	0.40	0.9901	0.0080	0.0000
615.94	0.74	0.39	0.9902	0.0080	0.0000
615.93	0.74	0.38	0.9903	0.0081	0.0000
615.92	0.73	0.37	0.9904	0.0081	0.0000
615.91	0.73	0.37	0.9904	0.0081	0.0000
615.90	0.73	0.36	0.9905	0.0081	0.0000
615.89	0.73	0.35	0.9906	0.0081	0.0000
615.88	0.72	0.34	0.9907	0.0081	0.0000
615.87	0.72	0.34	0.9908	0.0081	0.0000
615.86	0.72	0.33	0.9909	0.0081	0.0000
615.85	0.72	0.32	0.9910	0.0080	0.0000
615.84	0.71	0.31	0.9910	0.0080	0.0000
615.83	0.71	0.31	0.9911	0.0080	0.0000
615.82	0.71	0.30	0.9912	0.0080	0.0000
615.81	0.71	0.29	0.9913	0.0080	0.0000

$$Z_u = \rho_{ro} \beta_{ao} H_o / [\rho_{ro} \beta_{ao} - (1 - \rho_{ro}) \beta_{ow}]$$

= 616.48 feet

where:

$\rho_{ro}$  = 0.772

$\beta_{ao}$  = 2.90

$\beta_{ow}$  = 2.72

$H_o$  = 2.73 feet

$Z_{ow}$  = 612.7 feet

$Z_{ao}$  = 615.43 feet

Other parameters used in calculations (from Data Entry - MWs)

$S_m$  = 0.046

$\alpha$  = 0.125 /foot

$n$  = 3.005

$m$  = 0.334442596

$dZ$  = 0.01 feet      Integration increment (0.01 to 1.0)

$\phi$  = 0.437

Oil Specific Volume

$\Sigma \phi S_{of} dZ$  = 4.6589E-03 ft<sup>3</sup>/ft<sup>2</sup>      Oil Specific Volume

615.80	0.71	0.28	0.9914	0.0079	0.0000
615.79	0.70	0.27	0.9915	0.0079	0.0000
615.78	0.70	0.27	0.9915	0.0079	0.0000
615.77	0.70	0.26	0.9916	0.0078	0.0000
615.76	0.70	0.25	0.9917	0.0078	0.0000
615.75	0.69	0.24	0.9918	0.0078	0.0000
615.74	0.69	0.24	0.9919	0.0077	0.0000
615.73	0.69	0.23	0.9920	0.0077	0.0000
615.72	0.69	0.22	0.9920	0.0076	0.0000
615.71	0.69	0.21	0.9921	0.0076	0.0000
615.70	0.68	0.21	0.9922	0.0076	0.0000
615.69	0.68	0.20	0.9923	0.0075	0.0000
615.68	0.68	0.19	0.9923	0.0075	0.0000
615.67	0.68	0.18	0.9924	0.0074	0.0000
615.66	0.67	0.17	0.9925	0.0073	0.0000
615.65	0.67	0.17	0.9926	0.0073	0.0000
615.64	0.67	0.16	0.9926	0.0072	0.0000
615.63	0.67	0.15	0.9927	0.0072	0.0000
615.62	0.66	0.14	0.9928	0.0071	0.0000
615.61	0.66	0.14	0.9929	0.0071	0.0000
615.60	0.66	0.13	0.9929	0.0070	0.0000
615.59	0.66	0.12	0.9930	0.0069	0.0000
615.58	0.66	0.11	0.9931	0.0069	0.0000
615.57	0.65	0.10	0.9932	0.0068	0.0000
615.56	0.65	0.10	0.9932	0.0067	0.0000
615.55	0.65	0.09	0.9933	0.0067	0.0000
615.54	0.65	0.08	0.9934	0.0066	0.0000
615.53	0.64	0.07	0.9934	0.0066	0.0000
615.52	0.64	0.07	0.9935	0.0065	0.0000
615.51	0.64	0.06	0.9936	0.0064	0.0000
615.50	0.64	0.05	0.9936	0.0064	0.0000
615.49	0.64	0.04	0.9937	0.0063	0.0000
615.48	0.63	0.04	0.9938	0.0062	0.0000
615.47	0.63	0.03	0.9938	0.0062	0.0000
615.46	0.63	0.02	0.9939	0.0061	0.0000
615.45	0.63	0.01	0.9940	0.0060	0.0000
615.44	0.62	0.00	0.9940	0.0060	0.0000
615.43	0.62	0.00	0.9941	0.0059	0.0000
615.42	0.62	0.00	0.9942	0.0058	0.0000
615.41	0.62	0.00	0.9942	0.0058	0.0000
615.40	0.61	0.00	0.9943	0.0057	0.0000
615.39	0.61	0.00	0.9944	0.0056	0.0000
615.38	0.61	0.00	0.9944	0.0056	0.0000
615.37	0.61	0.00	0.9945	0.0055	0.0000
615.36	0.61	0.00	0.9945	0.0055	0.0000
615.35	0.60	0.00	0.9946	0.0054	0.0000
615.34	0.60	0.00	0.9947	0.0053	0.0000
615.33	0.60	0.00	0.9947	0.0053	0.0000
615.32	0.60	0.00	0.9948	0.0052	0.0000
615.31	0.59	0.00	0.9948	0.0052	0.0000
615.30	0.59	0.00	0.9949	0.0051	0.0000
615.29	0.59	0.00	0.9950	0.0050	0.0000
615.28	0.59	0.00	0.9950	0.0050	0.0000
615.27	0.58	0.00	0.9951	0.0049	0.0000
615.26	0.58	0.00	0.9951	0.0049	0.0000
615.25	0.58	0.00	0.9952	0.0048	0.0000
615.24	0.58	0.00	0.9952	0.0048	0.0000
615.23	0.58	0.00	0.9953	0.0047	0.0000
615.22	0.57	0.00	0.9954	0.0046	0.0000
615.21	0.57	0.00	0.9954	0.0046	0.0000
615.20	0.57	0.00	0.9955	0.0045	0.0000
615.19	0.57	0.00	0.9955	0.0045	0.0000
615.18	0.56	0.00	0.9956	0.0044	0.0000
615.17	0.56	0.00	0.9956	0.0044	0.0000
615.16	0.56	0.00	0.9957	0.0043	0.0000
615.15	0.56	0.00	0.9957	0.0043	0.0000
615.14	0.56	0.00	0.9958	0.0042	0.0000
615.13	0.55	0.00	0.9958	0.0042	0.0000
615.12	0.55	0.00	0.9959	0.0041	0.0000
615.11	0.55	0.00	0.9959	0.0041	0.0000
615.10	0.55	0.00	0.9960	0.0040	0.0000
615.09	0.54	0.00	0.9960	0.0040	0.0000
615.08	0.54	0.00	0.9961	0.0039	0.0000
615.07	0.54	0.00	0.9961	0.0039	0.0000
615.06	0.54	0.00	0.9962	0.0038	0.0000
615.05	0.53	0.00	0.9962	0.0038	0.0000
615.04	0.53	0.00	0.9963	0.0037	0.0000
615.03	0.53	0.00	0.9963	0.0037	0.0000
615.02	0.53	0.00	0.9964	0.0036	0.0000

615.01	0.53	0.00	0.9964	0.0036	0.0000
615.00	0.52	0.00	0.9965	0.0035	0.0000
614.99	0.52	0.00	0.9965	0.0035	0.0000
614.98	0.52	0.00	0.9966	0.0034	0.0000
614.97	0.52	0.00	0.9966	0.0034	0.0000
614.96	0.51	0.00	0.9966	0.0034	0.0000
614.95	0.51	0.00	0.9967	0.0033	0.0000
614.94	0.51	0.00	0.9967	0.0033	0.0000
614.93	0.51	0.00	0.9968	0.0032	0.0000
614.92	0.51	0.00	0.9968	0.0032	0.0000
614.91	0.50	0.00	0.9969	0.0031	0.0000
614.90	0.50	0.00	0.9969	0.0031	0.0000
614.89	0.50	0.00	0.9970	0.0030	0.0000
614.88	0.50	0.00	0.9970	0.0030	0.0000
614.87	0.49	0.00	0.9970	0.0030	0.0000
614.86	0.49	0.00	0.9971	0.0029	0.0000
614.85	0.49	0.00	0.9971	0.0029	0.0000
614.84	0.49	0.00	0.9972	0.0028	0.0000
614.83	0.48	0.00	0.9972	0.0028	0.0000
614.82	0.48	0.00	0.9972	0.0028	0.0000
614.81	0.48	0.00	0.9973	0.0027	0.0000
614.80	0.48	0.00	0.9973	0.0027	0.0000
614.79	0.48	0.00	0.9973	0.0027	0.0000
614.78	0.47	0.00	0.9974	0.0026	0.0000
614.77	0.47	0.00	0.9974	0.0026	0.0000
614.76	0.47	0.00	0.9975	0.0025	0.0000
614.75	0.47	0.00	0.9975	0.0025	0.0000
614.74	0.46	0.00	0.9975	0.0025	0.0000
614.73	0.46	0.00	0.9976	0.0024	0.0000
614.72	0.46	0.00	0.9976	0.0024	0.0000
614.71	0.46	0.00	0.9976	0.0024	0.0000
614.70	0.46	0.00	0.9977	0.0023	0.0000
614.69	0.45	0.00	0.9977	0.0023	0.0000
614.68	0.45	0.00	0.9977	0.0023	0.0000
614.67	0.45	0.00	0.9978	0.0022	0.0000
614.66	0.45	0.00	0.9978	0.0022	0.0000
614.65	0.44	0.00	0.9978	0.0022	0.0000
614.64	0.44	0.00	0.9979	0.0021	0.0000
614.63	0.44	0.00	0.9979	0.0021	0.0000
614.62	0.44	0.00	0.9979	0.0021	0.0000
614.61	0.43	0.00	0.9980	0.0020	0.0000
614.60	0.43	0.00	0.9980	0.0020	0.0000
614.59	0.43	0.00	0.9980	0.0020	0.0000
614.58	0.43	0.00	0.9981	0.0019	0.0000
614.57	0.43	0.00	0.9981	0.0019	0.0000
614.56	0.42	0.00	0.9981	0.0019	0.0000
614.55	0.42	0.00	0.9982	0.0018	0.0000
614.54	0.42	0.00	0.9982	0.0018	0.0000
614.53	0.42	0.00	0.9982	0.0018	0.0000
614.52	0.41	0.00	0.9983	0.0017	0.0000
614.51	0.41	0.00	0.9983	0.0017	0.0000
614.50	0.41	0.00	0.9983	0.0017	0.0000
614.49	0.41	0.00	0.9983	0.0017	0.0000
614.48	0.40	0.00	0.9984	0.0016	0.0000
614.47	0.40	0.00	0.9984	0.0016	0.0000
614.46	0.40	0.00	0.9984	0.0016	0.0000
614.45	0.40	0.00	0.9984	0.0016	0.0000
614.44	0.40	0.00	0.9985	0.0015	0.0000
614.43	0.39	0.00	0.9985	0.0015	0.0000
614.42	0.39	0.00	0.9985	0.0015	0.0000
614.41	0.39	0.00	0.9985	0.0015	0.0000
614.40	0.39	0.00	0.9986	0.0014	0.0000
614.39	0.38	0.00	0.9986	0.0014	0.0000
614.38	0.38	0.00	0.9986	0.0014	0.0000
614.37	0.38	0.00	0.9986	0.0014	0.0000
614.36	0.38	0.00	0.9987	0.0013	0.0000
614.35	0.38	0.00	0.9987	0.0013	0.0000
614.34	0.37	0.00	0.9987	0.0013	0.0000
614.33	0.37	0.00	0.9987	0.0013	0.0000
614.32	0.37	0.00	0.9988	0.0012	0.0000
614.31	0.37	0.00	0.9988	0.0012	0.0000
614.30	0.36	0.00	0.9988	0.0012	0.0000
614.29	0.36	0.00	0.9988	0.0012	0.0000
614.28	0.36	0.00	0.9989	0.0011	0.0000
614.27	0.36	0.00	0.9989	0.0011	0.0000
614.26	0.35	0.00	0.9989	0.0011	0.0000
614.25	0.35	0.00	0.9989	0.0011	0.0000
614.24	0.35	0.00	0.9989	0.0011	0.0000
614.23	0.35	0.00	0.9990	0.0010	0.0000







Oil Specific Volume      0.0047    ft<sup>3</sup>/ft<sup>2</sup>

Data Entry Worksheet for Soil Samples -- Oil Specific Volume (OSV) Calculations

Project No. = 406   = User must enter the soil or fluid parameter, or lab data, as appropriate  
 Boring Designation = MW-27

Soil Parameters

Fluid Parameters

Oil Parameters

Required to Estimate OSV - Soil

Required to Estimate OSV - Soil

$\rho_b = 1.5 \text{ g/cm}^3$  Bulk density of soil

$\rho_o = 0.772 \text{ g/cm}^3$  Oil density

Soil Sample Data

Sample Intervals (maximum 21 samples)

	Feet (bgs)	to	Feet (bgs)	GRO or DRO (mg/kg)
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				

Deepest sample must be entered in this row

Data Entry Worksheet for Monitoring Well Fluid Data -- Oil Specific Volume (OSV) Calculations

Project No. = 406  
Boring Designation = MW-27

[ ] = User must enter the soil or fluid parameter, or lab data, as appropriate

Soil Parameters

Required to Estimate OSV - MWs

$\phi$  = 0.437 Total porosity  
 $\sigma_{ow}$  = 24.1 dynes/cm Oil/Water Interfacial Tension  
 $\sigma_{ao}$  = 22.6 dynes/cm Air/Oil Surface Tension  
 $\sigma_{aw}$  = 65.5 dynes/cm Air/Water Surface Tension  
 $\alpha$  = 0.125 /foot Van Genuchten mean pore-size parameter  
 $n$  = 3.00500 Van Genuchten pore-size distribution exponent  
 $S_m$  = 0.046 Irreducible water saturation

Fluid Parameters

$\rho_{ro}$  = 0.772 Ratio of oil to water density  
 $\beta_{ao}$  = 2.90 Ratio of water surface tension to oil surface tension  
 $\beta_{ow}$  = 2.72 Ratio of water surface tension to oil-water interfacial tension  
 $Z_{ow}$  = 21.3 feet Depth to oil/air interface  
 $Z_{ao}$  = 25.54 feet Depth to oil/water interface  
 $S_m$  = 0.046 Water saturation at field capacity  
 $\alpha$  = 0.125 /foot Van Genuchten mean pore-size parameter  
 $n$  = 3.00500 Van Genuchten pore-size distribution exponent  
 $m$  = 0.334443 Calculated from "n" (Burdine)  
 $dZ$  = 0.01 feet Integration increment (0.01 to 1.0)  
TOC = 637.67 feet Elevation of TOC or measuring point



Oil Specific Volume Calculation Spreadsheet for Free-phase Hydrocarbon in Monitoring Wells

Project No. 406  
 Boring Designation MW-27

**DO NOT CHANGE ANY CELLS ON THIS WORKSHEET**

Z (feet)	h <sub>ow</sub> (feet)	h <sub>ao</sub> (feet)	S <sub>w</sub> (-)	S <sub>of</sub> (-)	φ S <sub>of</sub> dZ (ft <sup>3</sup> /ft <sup>2</sup> )
Z <sub>u</sub> = 617.99	1.34	1.25	0.9449	0.0000	0.0000
617.98	1.33	1.25	0.9451	0.0007	0.0000
617.97	1.33	1.24	0.9454	0.0014	0.0000
617.96	1.33	1.23	0.9456	0.0020	0.0000
617.95	1.33	1.22	0.9459	0.0027	0.0000
617.94	1.33	1.22	0.9462	0.0033	0.0000
617.93	1.32	1.21	0.9464	0.0040	0.0000
617.92	1.32	1.20	0.9467	0.0046	0.0000
617.91	1.32	1.19	0.9469	0.0052	0.0000
617.90	1.32	1.18	0.9472	0.0058	0.0000
617.89	1.31	1.18	0.9474	0.0064	0.0000
617.88	1.31	1.17	0.9477	0.0070	0.0000
617.87	1.31	1.16	0.9480	0.0076	0.0000
617.86	1.31	1.15	0.9482	0.0082	0.0000
617.85	1.31	1.15	0.9485	0.0088	0.0000
617.84	1.30	1.14	0.9487	0.0093	0.0000
617.83	1.30	1.13	0.9490	0.0099	0.0000
617.82	1.30	1.12	0.9492	0.0104	0.0000
617.81	1.30	1.11	0.9495	0.0110	0.0000
617.80	1.29	1.11	0.9497	0.0115	0.0001
617.79	1.29	1.10	0.9500	0.0120	0.0001
617.78	1.29	1.09	0.9502	0.0125	0.0001
617.77	1.29	1.08	0.9505	0.0130	0.0001
617.76	1.28	1.08	0.9507	0.0135	0.0001
617.75	1.28	1.07	0.9509	0.0140	0.0001
617.74	1.28	1.06	0.9512	0.0145	0.0001
617.73	1.28	1.05	0.9514	0.0149	0.0001
617.72	1.28	1.05	0.9517	0.0154	0.0001
617.71	1.27	1.04	0.9519	0.0158	0.0001
617.70	1.27	1.03	0.9522	0.0163	0.0001
617.69	1.27	1.02	0.9524	0.0167	0.0001
617.68	1.27	1.01	0.9526	0.0172	0.0001
617.67	1.26	1.01	0.9529	0.0176	0.0001
617.66	1.26	1.00	0.9531	0.0180	0.0001
617.65	1.26	0.99	0.9534	0.0184	0.0001
617.64	1.26	0.98	0.9536	0.0188	0.0001
617.63	1.25	0.98	0.9538	0.0192	0.0001
617.62	1.25	0.97	0.9541	0.0195	0.0001
617.61	1.25	0.96	0.9543	0.0199	0.0001
617.60	1.25	0.95	0.9545	0.0203	0.0001
617.59	1.25	0.94	0.9548	0.0206	0.0001
617.58	1.24	0.94	0.9550	0.0210	0.0001
617.57	1.24	0.93	0.9552	0.0213	0.0001
617.56	1.24	0.92	0.9555	0.0216	0.0001
617.55	1.24	0.91	0.9557	0.0220	0.0001
617.54	1.23	0.91	0.9559	0.0223	0.0001
617.53	1.23	0.90	0.9562	0.0226	0.0001
617.52	1.23	0.89	0.9564	0.0229	0.0001
617.51	1.23	0.88	0.9566	0.0232	0.0001
617.50	1.23	0.88	0.9569	0.0235	0.0001
617.49	1.22	0.87	0.9571	0.0237	0.0001
617.48	1.22	0.86	0.9573	0.0240	0.0001
617.47	1.22	0.85	0.9575	0.0243	0.0001
617.46	1.22	0.84	0.9578	0.0245	0.0001
617.45	1.21	0.84	0.9580	0.0248	0.0001
617.44	1.21	0.83	0.9582	0.0250	0.0001
617.43	1.21	0.82	0.9584	0.0252	0.0001
617.42	1.21	0.81	0.9587	0.0255	0.0001
617.41	1.20	0.81	0.9589	0.0257	0.0001
617.40	1.20	0.80	0.9591	0.0259	0.0001
617.39	1.20	0.79	0.9593	0.0261	0.0001
617.38	1.20	0.78	0.9595	0.0263	0.0001
617.37	1.20	0.78	0.9598	0.0265	0.0001
617.36	1.19	0.77	0.9600	0.0267	0.0001
617.35	1.19	0.76	0.9602	0.0268	0.0001
617.34	1.19	0.75	0.9604	0.0270	0.0001
617.33	1.19	0.74	0.9606	0.0272	0.0001
617.32	1.18	0.74	0.9608	0.0273	0.0001

$$Z_u = \rho_{ro} \beta_{ao} H_o / [\rho_{ro} \beta_{ao} - (1 - \rho_{ro}) \beta_{ow}]$$

= 617.99 feet

where:

ρ<sub>ro</sub> = 0.772

β<sub>ao</sub> = 2.90

β<sub>ow</sub> = 2.72

H<sub>o</sub> = 4.24 feet

Z<sub>ow</sub> = 612.13 feet

Z<sub>ao</sub> = 616.37 feet

Other parameters used in calculations (from Data Entry - MWs)

S<sub>m</sub> = 0.046

α = 0.125 /foot

n = 3.005

m = 0.334442596

dZ = 0.01 feet      Integration increment (0.01 to 1.0)

φ = 0.437

Oil Specific Volume

Σφ S<sub>of</sub> dZ = 2.6333E-02 ft<sup>3</sup>/ft<sup>2</sup>      Oil Specific Volume

617.31	1.18	0.73	0.9611	0.0275	0.0001
617.30	1.18	0.72	0.9613	0.0276	0.0001
617.29	1.18	0.71	0.9615	0.0278	0.0001
617.28	1.18	0.71	0.9617	0.0279	0.0001
617.27	1.17	0.70	0.9619	0.0280	0.0001
617.26	1.17	0.69	0.9621	0.0281	0.0001
617.25	1.17	0.68	0.9623	0.0282	0.0001
617.24	1.17	0.67	0.9625	0.0283	0.0001
617.23	1.16	0.67	0.9628	0.0284	0.0001
617.22	1.16	0.66	0.9630	0.0285	0.0001
617.21	1.16	0.65	0.9632	0.0286	0.0001
617.20	1.16	0.64	0.9634	0.0287	0.0001
617.19	1.15	0.64	0.9636	0.0288	0.0001
617.18	1.15	0.63	0.9638	0.0288	0.0001
617.17	1.15	0.62	0.9640	0.0289	0.0001
617.16	1.15	0.61	0.9642	0.0289	0.0001
617.15	1.15	0.61	0.9644	0.0290	0.0001
617.14	1.14	0.60	0.9646	0.0290	0.0001
617.13	1.14	0.59	0.9648	0.0291	0.0001
617.12	1.14	0.58	0.9650	0.0291	0.0001
617.11	1.14	0.57	0.9652	0.0291	0.0001
617.10	1.13	0.57	0.9654	0.0292	0.0001
617.09	1.13	0.56	0.9656	0.0292	0.0001
617.08	1.13	0.55	0.9658	0.0292	0.0001
617.07	1.13	0.54	0.9660	0.0292	0.0001
617.06	1.12	0.54	0.9662	0.0292	0.0001
617.05	1.12	0.53	0.9664	0.0292	0.0001
617.04	1.12	0.52	0.9666	0.0292	0.0001
617.03	1.12	0.51	0.9668	0.0292	0.0001
617.02	1.12	0.50	0.9670	0.0292	0.0001
617.01	1.11	0.50	0.9672	0.0292	0.0001
617.00	1.11	0.49	0.9674	0.0291	0.0001
616.99	1.11	0.48	0.9676	0.0291	0.0001
616.98	1.11	0.47	0.9677	0.0291	0.0001
616.97	1.10	0.47	0.9679	0.0290	0.0001
616.96	1.10	0.46	0.9681	0.0290	0.0001
616.95	1.10	0.45	0.9683	0.0289	0.0001
616.94	1.10	0.44	0.9685	0.0289	0.0001
616.93	1.10	0.44	0.9687	0.0288	0.0001
616.92	1.09	0.43	0.9689	0.0288	0.0001
616.91	1.09	0.42	0.9691	0.0287	0.0001
616.90	1.09	0.41	0.9693	0.0286	0.0001
616.89	1.09	0.40	0.9694	0.0286	0.0001
616.88	1.08	0.40	0.9696	0.0285	0.0001
616.87	1.08	0.39	0.9698	0.0284	0.0001
616.86	1.08	0.38	0.9700	0.0283	0.0001
616.85	1.08	0.37	0.9702	0.0283	0.0001
616.84	1.07	0.37	0.9704	0.0282	0.0001
616.83	1.07	0.36	0.9705	0.0281	0.0001
616.82	1.07	0.35	0.9707	0.0280	0.0001
616.81	1.07	0.34	0.9709	0.0279	0.0001
616.80	1.07	0.34	0.9711	0.0278	0.0001
616.79	1.06	0.33	0.9713	0.0277	0.0001
616.78	1.06	0.32	0.9714	0.0276	0.0001
616.77	1.06	0.31	0.9716	0.0275	0.0001
616.76	1.06	0.30	0.9718	0.0274	0.0001
616.75	1.05	0.30	0.9720	0.0273	0.0001
616.74	1.05	0.29	0.9721	0.0271	0.0001
616.73	1.05	0.28	0.9723	0.0270	0.0001
616.72	1.05	0.27	0.9725	0.0269	0.0001
616.71	1.05	0.27	0.9727	0.0268	0.0001
616.70	1.04	0.26	0.9728	0.0267	0.0001
616.69	1.04	0.25	0.9730	0.0265	0.0001
616.68	1.04	0.24	0.9732	0.0264	0.0001
616.67	1.04	0.23	0.9733	0.0263	0.0001
616.66	1.03	0.23	0.9735	0.0261	0.0001
616.65	1.03	0.22	0.9737	0.0260	0.0001
616.64	1.03	0.21	0.9739	0.0259	0.0001
616.63	1.03	0.20	0.9740	0.0257	0.0001
616.62	1.02	0.20	0.9742	0.0256	0.0001
616.61	1.02	0.19	0.9744	0.0254	0.0001
616.60	1.02	0.18	0.9745	0.0253	0.0001
616.59	1.02	0.17	0.9747	0.0252	0.0001
616.58	1.02	0.17	0.9749	0.0250	0.0001
616.57	1.01	0.16	0.9750	0.0249	0.0001
616.56	1.01	0.15	0.9752	0.0247	0.0001
616.55	1.01	0.14	0.9753	0.0246	0.0001
616.54	1.01	0.13	0.9755	0.0244	0.0001
616.53	1.00	0.13	0.9757	0.0243	0.0001

616.52	1.00	0.12	0.9758	0.0241	0.0001
616.51	1.00	0.11	0.9760	0.0240	0.0001
616.50	1.00	0.10	0.9761	0.0238	0.0001
616.49	1.00	0.10	0.9763	0.0237	0.0001
616.48	0.99	0.09	0.9765	0.0235	0.0001
616.47	0.99	0.08	0.9766	0.0234	0.0001
616.46	0.99	0.07	0.9768	0.0232	0.0001
616.45	0.99	0.06	0.9769	0.0231	0.0001
616.44	0.98	0.06	0.9771	0.0229	0.0001
616.43	0.98	0.05	0.9772	0.0228	0.0001
616.42	0.98	0.04	0.9774	0.0226	0.0001
616.41	0.98	0.03	0.9775	0.0225	0.0001
616.40	0.97	0.03	0.9777	0.0223	0.0001
616.39	0.97	0.02	0.9779	0.0221	0.0001
616.38	0.97	0.01	0.9780	0.0220	0.0001
616.37	0.97	0.00	0.9782	0.0218	0.0001
616.36	0.97	0.00	0.9783	0.0217	0.0001
616.35	0.96	0.00	0.9785	0.0215	0.0001
616.34	0.96	0.00	0.9786	0.0214	0.0001
616.33	0.96	0.00	0.9787	0.0213	0.0001
616.32	0.96	0.00	0.9789	0.0211	0.0001
616.31	0.95	0.00	0.9790	0.0210	0.0001
616.30	0.95	0.00	0.9792	0.0208	0.0001
616.29	0.95	0.00	0.9793	0.0207	0.0001
616.28	0.95	0.00	0.9795	0.0205	0.0001
616.27	0.94	0.00	0.9796	0.0204	0.0001
616.26	0.94	0.00	0.9798	0.0202	0.0001
616.25	0.94	0.00	0.9799	0.0201	0.0001
616.24	0.94	0.00	0.9801	0.0199	0.0001
616.23	0.94	0.00	0.9802	0.0198	0.0001
616.22	0.93	0.00	0.9803	0.0197	0.0001
616.21	0.93	0.00	0.9805	0.0195	0.0001
616.20	0.93	0.00	0.9806	0.0194	0.0001
616.19	0.93	0.00	0.9808	0.0192	0.0001
616.18	0.92	0.00	0.9809	0.0191	0.0001
616.17	0.92	0.00	0.9810	0.0190	0.0001
616.16	0.92	0.00	0.9812	0.0188	0.0001
616.15	0.92	0.00	0.9813	0.0187	0.0001
616.14	0.92	0.00	0.9814	0.0186	0.0001
616.13	0.91	0.00	0.9816	0.0184	0.0001
616.12	0.91	0.00	0.9817	0.0183	0.0001
616.11	0.91	0.00	0.9818	0.0182	0.0001
616.10	0.91	0.00	0.9820	0.0180	0.0001
616.09	0.90	0.00	0.9821	0.0179	0.0001
616.08	0.90	0.00	0.9822	0.0178	0.0001
616.07	0.90	0.00	0.9824	0.0176	0.0001
616.06	0.90	0.00	0.9825	0.0175	0.0001
616.05	0.89	0.00	0.9826	0.0174	0.0001
616.04	0.89	0.00	0.9828	0.0172	0.0001
616.03	0.89	0.00	0.9829	0.0171	0.0001
616.02	0.89	0.00	0.9830	0.0170	0.0001
616.01	0.89	0.00	0.9831	0.0169	0.0001
616.00	0.88	0.00	0.9833	0.0167	0.0001
615.99	0.88	0.00	0.9834	0.0166	0.0001
615.98	0.88	0.00	0.9835	0.0165	0.0001
615.97	0.88	0.00	0.9837	0.0163	0.0001
615.96	0.87	0.00	0.9838	0.0162	0.0001
615.95	0.87	0.00	0.9839	0.0161	0.0001
615.94	0.87	0.00	0.9840	0.0160	0.0001
615.93	0.87	0.00	0.9842	0.0158	0.0001
615.92	0.87	0.00	0.9843	0.0157	0.0001
615.91	0.86	0.00	0.9844	0.0156	0.0001
615.90	0.86	0.00	0.9845	0.0155	0.0001
615.89	0.86	0.00	0.9846	0.0154	0.0001
615.88	0.86	0.00	0.9848	0.0152	0.0001
615.87	0.85	0.00	0.9849	0.0151	0.0001
615.86	0.85	0.00	0.9850	0.0150	0.0001
615.85	0.85	0.00	0.9851	0.0149	0.0001
615.84	0.85	0.00	0.9852	0.0148	0.0001
615.83	0.84	0.00	0.9853	0.0147	0.0001
615.82	0.84	0.00	0.9855	0.0145	0.0001
615.81	0.84	0.00	0.9856	0.0144	0.0001
615.80	0.84	0.00	0.9857	0.0143	0.0001
615.79	0.84	0.00	0.9858	0.0142	0.0001
615.78	0.83	0.00	0.9859	0.0141	0.0001
615.77	0.83	0.00	0.9860	0.0140	0.0001
615.76	0.83	0.00	0.9861	0.0139	0.0001
615.75	0.83	0.00	0.9863	0.0137	0.0001
615.74	0.82	0.00	0.9864	0.0136	0.0001



615.73	0.82	0.00	0.9865	0.0135	0.0001
615.72	0.82	0.00	0.9866	0.0134	0.0001
615.71	0.82	0.00	0.9867	0.0133	0.0001
615.70	0.81	0.00	0.9868	0.0132	0.0001
615.69	0.81	0.00	0.9869	0.0131	0.0001
615.68	0.81	0.00	0.9870	0.0130	0.0001
615.67	0.81	0.00	0.9871	0.0129	0.0001
615.66	0.81	0.00	0.9872	0.0128	0.0001
615.65	0.80	0.00	0.9873	0.0127	0.0001
615.64	0.80	0.00	0.9875	0.0125	0.0001
615.63	0.80	0.00	0.9876	0.0124	0.0001
615.62	0.80	0.00	0.9877	0.0123	0.0001
615.61	0.79	0.00	0.9878	0.0122	0.0001
615.60	0.79	0.00	0.9879	0.0121	0.0001
615.59	0.79	0.00	0.9880	0.0120	0.0001
615.58	0.79	0.00	0.9881	0.0119	0.0001
615.57	0.79	0.00	0.9882	0.0118	0.0001
615.56	0.78	0.00	0.9883	0.0117	0.0001
615.55	0.78	0.00	0.9884	0.0116	0.0001
615.54	0.78	0.00	0.9885	0.0115	0.0001
615.53	0.78	0.00	0.9886	0.0114	0.0000
615.52	0.77	0.00	0.9887	0.0113	0.0000
615.51	0.77	0.00	0.9888	0.0112	0.0000
615.50	0.77	0.00	0.9889	0.0111	0.0000
615.49	0.77	0.00	0.9890	0.0110	0.0000
615.48	0.76	0.00	0.9891	0.0109	0.0000
615.47	0.76	0.00	0.9892	0.0108	0.0000
615.46	0.76	0.00	0.9893	0.0107	0.0000
615.45	0.76	0.00	0.9894	0.0106	0.0000
615.44	0.76	0.00	0.9895	0.0105	0.0000
615.43	0.75	0.00	0.9895	0.0105	0.0000
615.42	0.75	0.00	0.9896	0.0104	0.0000
615.41	0.75	0.00	0.9897	0.0103	0.0000
615.40	0.75	0.00	0.9898	0.0102	0.0000
615.39	0.74	0.00	0.9899	0.0101	0.0000
615.38	0.74	0.00	0.9900	0.0100	0.0000
615.37	0.74	0.00	0.9901	0.0099	0.0000
615.36	0.74	0.00	0.9902	0.0098	0.0000
615.35	0.74	0.00	0.9903	0.0097	0.0000
615.34	0.73	0.00	0.9904	0.0096	0.0000
615.33	0.73	0.00	0.9905	0.0095	0.0000
615.32	0.73	0.00	0.9905	0.0095	0.0000
615.31	0.73	0.00	0.9906	0.0094	0.0000
615.30	0.72	0.00	0.9907	0.0093	0.0000
615.29	0.72	0.00	0.9908	0.0092	0.0000
615.28	0.72	0.00	0.9909	0.0091	0.0000
615.27	0.72	0.00	0.9910	0.0090	0.0000
615.26	0.71	0.00	0.9911	0.0089	0.0000
615.25	0.71	0.00	0.9911	0.0089	0.0000
615.24	0.71	0.00	0.9912	0.0088	0.0000
615.23	0.71	0.00	0.9913	0.0087	0.0000
615.22	0.71	0.00	0.9914	0.0086	0.0000
615.21	0.70	0.00	0.9915	0.0085	0.0000
615.20	0.70	0.00	0.9916	0.0084	0.0000
615.19	0.70	0.00	0.9916	0.0084	0.0000
615.18	0.70	0.00	0.9917	0.0083	0.0000
615.17	0.69	0.00	0.9918	0.0082	0.0000
615.16	0.69	0.00	0.9919	0.0081	0.0000
615.15	0.69	0.00	0.9920	0.0080	0.0000
615.14	0.69	0.00	0.9920	0.0080	0.0000
615.13	0.68	0.00	0.9921	0.0079	0.0000
615.12	0.68	0.00	0.9922	0.0078	0.0000
615.11	0.68	0.00	0.9923	0.0077	0.0000
615.10	0.68	0.00	0.9924	0.0076	0.0000
615.09	0.68	0.00	0.9924	0.0076	0.0000
615.08	0.67	0.00	0.9925	0.0075	0.0000
615.07	0.67	0.00	0.9926	0.0074	0.0000
615.06	0.67	0.00	0.9927	0.0073	0.0000
615.05	0.67	0.00	0.9927	0.0073	0.0000
615.04	0.66	0.00	0.9928	0.0072	0.0000
615.03	0.66	0.00	0.9929	0.0071	0.0000
615.02	0.66	0.00	0.9929	0.0071	0.0000
615.01	0.66	0.00	0.9930	0.0070	0.0000
615.00	0.66	0.00	0.9931	0.0069	0.0000
614.99	0.65	0.00	0.9932	0.0068	0.0000
614.98	0.65	0.00	0.9932	0.0068	0.0000
614.97	0.65	0.00	0.9933	0.0067	0.0000
614.96	0.65	0.00	0.9934	0.0066	0.0000
614.95	0.64	0.00	0.9934	0.0066	0.0000

614.94	0.64	0.00	0.9935	0.0065	0.0000
614.93	0.64	0.00	0.9936	0.0064	0.0000
614.92	0.64	0.00	0.9936	0.0064	0.0000
614.91	0.63	0.00	0.9937	0.0063	0.0000
614.90	0.63	0.00	0.9938	0.0062	0.0000
614.89	0.63	0.00	0.9939	0.0061	0.0000
614.88	0.63	0.00	0.9939	0.0061	0.0000
614.87	0.63	0.00	0.9940	0.0060	0.0000
614.86	0.62	0.00	0.9940	0.0060	0.0000
614.85	0.62	0.00	0.9941	0.0059	0.0000
614.84	0.62	0.00	0.9942	0.0058	0.0000
614.83	0.62	0.00	0.9942	0.0058	0.0000
614.82	0.61	0.00	0.9943	0.0057	0.0000
614.81	0.61	0.00	0.9944	0.0056	0.0000
614.80	0.61	0.00	0.9944	0.0056	0.0000
614.79	0.61	0.00	0.9945	0.0055	0.0000
614.78	0.61	0.00	0.9946	0.0054	0.0000
614.77	0.60	0.00	0.9946	0.0054	0.0000
614.76	0.60	0.00	0.9947	0.0053	0.0000
614.75	0.60	0.00	0.9947	0.0053	0.0000
614.74	0.60	0.00	0.9948	0.0052	0.0000
614.73	0.59	0.00	0.9949	0.0051	0.0000
614.72	0.59	0.00	0.9949	0.0051	0.0000
614.71	0.59	0.00	0.9950	0.0050	0.0000
614.70	0.59	0.00	0.9950	0.0050	0.0000
614.69	0.58	0.00	0.9951	0.0049	0.0000
614.68	0.58	0.00	0.9951	0.0049	0.0000
614.67	0.58	0.00	0.9952	0.0048	0.0000
614.66	0.58	0.00	0.9953	0.0047	0.0000
614.65	0.58	0.00	0.9953	0.0047	0.0000
614.64	0.57	0.00	0.9954	0.0046	0.0000
614.63	0.57	0.00	0.9954	0.0046	0.0000
614.62	0.57	0.00	0.9955	0.0045	0.0000
614.61	0.57	0.00	0.9955	0.0045	0.0000
614.60	0.56	0.00	0.9956	0.0044	0.0000
614.59	0.56	0.00	0.9956	0.0044	0.0000
614.58	0.56	0.00	0.9957	0.0043	0.0000
614.57	0.56	0.00	0.9957	0.0043	0.0000
614.56	0.55	0.00	0.9958	0.0042	0.0000
614.55	0.55	0.00	0.9958	0.0042	0.0000
614.54	0.55	0.00	0.9959	0.0041	0.0000
614.53	0.55	0.00	0.9959	0.0041	0.0000
614.52	0.55	0.00	0.9960	0.0040	0.0000
614.51	0.54	0.00	0.9960	0.0040	0.0000
614.50	0.54	0.00	0.9961	0.0039	0.0000
614.49	0.54	0.00	0.9961	0.0039	0.0000
614.48	0.54	0.00	0.9962	0.0038	0.0000
614.47	0.53	0.00	0.9962	0.0038	0.0000
614.46	0.53	0.00	0.9963	0.0037	0.0000
614.45	0.53	0.00	0.9963	0.0037	0.0000
614.44	0.53	0.00	0.9964	0.0036	0.0000
614.43	0.53	0.00	0.9964	0.0036	0.0000
614.42	0.52	0.00	0.9965	0.0035	0.0000
614.41	0.52	0.00	0.9965	0.0035	0.0000
614.40	0.52	0.00	0.9966	0.0034	0.0000
614.39	0.52	0.00	0.9966	0.0034	0.0000
614.38	0.51	0.00	0.9967	0.0033	0.0000
614.37	0.51	0.00	0.9967	0.0033	0.0000
614.36	0.51	0.00	0.9967	0.0033	0.0000
614.35	0.51	0.00	0.9968	0.0032	0.0000
614.34	0.50	0.00	0.9968	0.0032	0.0000
614.33	0.50	0.00	0.9969	0.0031	0.0000
614.32	0.50	0.00	0.9969	0.0031	0.0000
614.31	0.50	0.00	0.9970	0.0030	0.0000
614.30	0.50	0.00	0.9970	0.0030	0.0000
614.29	0.49	0.00	0.9970	0.0030	0.0000
614.28	0.49	0.00	0.9971	0.0029	0.0000
614.27	0.49	0.00	0.9971	0.0029	0.0000
614.26	0.49	0.00	0.9972	0.0028	0.0000
614.25	0.48	0.00	0.9972	0.0028	0.0000
614.24	0.48	0.00	0.9972	0.0028	0.0000
614.23	0.48	0.00	0.9973	0.0027	0.0000
614.22	0.48	0.00	0.9973	0.0027	0.0000
614.21	0.48	0.00	0.9974	0.0026	0.0000
614.20	0.47	0.00	0.9974	0.0026	0.0000
614.19	0.47	0.00	0.9974	0.0026	0.0000
614.18	0.47	0.00	0.9975	0.0025	0.0000
614.17	0.47	0.00	0.9975	0.0025	0.0000
614.16	0.46	0.00	0.9975	0.0025	0.0000





612.57	0.10	0.00	1.0000	0.0000	0.0000
612.56	0.10	0.00	1.0000	0.0000	0.0000
612.55	0.10	0.00	1.0000	0.0000	0.0000
612.54	0.09	0.00	1.0000	0.0000	0.0000
612.53	0.09	0.00	1.0000	0.0000	0.0000
612.52	0.09	0.00	1.0000	0.0000	0.0000
612.51	0.09	0.00	1.0000	0.0000	0.0000
612.50	0.09	0.00	1.0000	0.0000	0.0000
612.49	0.08	0.00	1.0000	0.0000	0.0000
612.48	0.08	0.00	1.0000	0.0000	0.0000
612.47	0.08	0.00	1.0000	0.0000	0.0000
612.46	0.08	0.00	1.0000	0.0000	0.0000
612.45	0.07	0.00	1.0000	0.0000	0.0000
612.44	0.07	0.00	1.0000	0.0000	0.0000
612.43	0.07	0.00	1.0000	0.0000	0.0000
612.42	0.07	0.00	1.0000	0.0000	0.0000
612.41	0.06	0.00	1.0000	0.0000	0.0000
612.40	0.06	0.00	1.0000	0.0000	0.0000
612.39	0.06	0.00	1.0000	0.0000	0.0000
612.38	0.06	0.00	1.0000	0.0000	0.0000
612.37	0.06	0.00	1.0000	0.0000	0.0000
612.36	0.05	0.00	1.0000	0.0000	0.0000
612.35	0.05	0.00	1.0000	0.0000	0.0000
612.34	0.05	0.00	1.0000	0.0000	0.0000
612.33	0.05	0.00	1.0000	0.0000	0.0000
612.32	0.04	0.00	1.0000	0.0000	0.0000
612.31	0.04	0.00	1.0000	0.0000	0.0000
612.30	0.04	0.00	1.0000	0.0000	0.0000
612.29	0.04	0.00	1.0000	0.0000	0.0000
612.28	0.04	0.00	1.0000	0.0000	0.0000
612.27	0.03	0.00	1.0000	0.0000	0.0000
612.26	0.03	0.00	1.0000	0.0000	0.0000
612.25	0.03	0.00	1.0000	0.0000	0.0000
612.24	0.03	0.00	1.0000	0.0000	0.0000
612.23	0.02	0.00	1.0000	0.0000	0.0000
612.22	0.02	0.00	1.0000	0.0000	0.0000
612.21	0.02	0.00	1.0000	0.0000	0.0000
612.20	0.02	0.00	1.0000	0.0000	0.0000
612.19	0.01	0.00	1.0000	0.0000	0.0000
612.18	0.01	0.00	1.0000	0.0000	0.0000
612.17	0.01	0.00	1.0000	0.0000	0.0000
612.16	0.01	0.00	1.0000	0.0000	0.0000
612.15	0.01	0.00	1.0000	0.0000	0.0000
612.14	0.00	0.00	1.0000	0.0000	0.0000
612.13	0.00	0.00	1.0000	0.0000	0.0000
Zow = 612.13	0.00	0.00	1.0000	0.0000	0.0000
Zow = 612.13	0.00	0.00	1.0000	0.0000	0.0000
Zow = 612.13	0.00	0.00	1.0000	0.0000	0.0000
Zow = 612.13	0.00	0.00	1.0000	0.0000	0.0000
Zow = 612.13	0.00	0.00	1.0000	0.0000	0.0000

Oil Specific Volume      0.0263    ft<sup>3</sup>/ft<sup>2</sup>

Data Entry Worksheet for Soil Samples -- Oil Specific Volume (OSV) Calculations

Project No. = 406   = User must enter the soil or fluid parameter, or lab data, as appropriate  
 Boring Designation = MW-32

Soil Parameters

Fluid Parameters

Oil Parameters

Required to Estimate OSV - Soil

Required to Estimate OSV - Soil

$\rho_b = 1.5 \text{ g/cm}^3$  Bulk density of soil

$\rho_o = 0.7875 \text{ g/cm}^3$  Oil density

Soil Sample Data

Sample Intervals (maximum 21 samples)

	Feet (bgs)	to	Feet (bgs)	GRO or DRO (mg/kg)
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				

Deepest sample must be entered in this row

## Data Entry Worksheet for Monitoring Well Fluid Data -- Oil Specific Volume (OSV) Calculations

Project No. = 406  
Boring Designation = MW-32

= User must enter the soil or fluid parameter, or lab data, as appropriate

### Soil Parameters

#### Required to Estimate OSV - MWs

$\phi$  = 0.437 Total porosity  
 $\sigma_{ow}$  = 25.4 dynes/cm Oil/Water Interfacial Tension  
 $\sigma_{ao}$  = 23.1 dynes/cm Air/Oil Surface Tension  
 $\sigma_{aw}$  = 68.8 dynes/cm Air/Water Surface Tension  
 $\alpha$  = 0.125 /foot Van Genuchten mean pore-size parameter  
 $n$  = 3.00500 Van Genuchten pore-size distribution exponent  
 $S_m$  = 0.046 Irreducible water saturation

### Fluid Parameters

$\rho_{ro}$  = 0.7875 Ratio of oil to water density  
 $\beta_{ao}$  = 2.98 Ratio of water surface tension to oil surface tension  
 $\beta_{ow}$  = 2.71 Ratio of water surface tension to oil-water interfacial tension  
 $Z_{ow}$  = 19.52 feet Depth to oil/air interface  
 $Z_{ao}$  = 22.94 feet Depth to oil/water interface  
 $S_m$  = 0.046 Water saturation at field capacity  
 $\alpha$  = 0.125 /foot Van Genuchten mean pore-size parameter  
 $n$  = 3.00500 Van Genuchten pore-size distribution exponent  
 $m$  = 0.334443 Calculated from "n" (Burdine)  
 $dZ$  = 0.01 feet Integration increment (0.01 to 1.0)  
TOC = 634.08 feet Elevation of TOC or measuring point





Oil Specific Volume Calculation Spreadsheet for Free-phase Hydrocarbon in Monitoring Wells

Project No. 406  
 Boring Designation MW-32

**DO NOT CHANGE ANY CELLS ON THIS WORKSHEET**

Z (feet)	$h_{ow}$ (feet)	$h_{ao}$ (feet)	$S_w$ (-)	$S_{of}$ (-)	$\phi S_{of} dZ$ (ft <sup>3</sup> /ft <sup>2</sup> )
Z_u= 615.67	0.96	0.88	0.9787	0.0000	0.0000
615.66	0.96	0.87	0.9788	0.0004	0.0000
615.65	0.96	0.86	0.9789	0.0008	0.0000
615.64	0.96	0.85	0.9791	0.0012	0.0000
615.63	0.95	0.84	0.9792	0.0016	0.0000
615.62	0.95	0.84	0.9793	0.0020	0.0000
615.61	0.95	0.83	0.9795	0.0024	0.0000
615.60	0.95	0.82	0.9796	0.0027	0.0000
615.59	0.95	0.81	0.9797	0.0031	0.0000
615.58	0.94	0.81	0.9799	0.0035	0.0000
615.57	0.94	0.80	0.9800	0.0038	0.0000
615.56	0.94	0.79	0.9801	0.0041	0.0000
615.55	0.94	0.78	0.9803	0.0045	0.0000
615.54	0.94	0.77	0.9804	0.0048	0.0000
615.53	0.93	0.77	0.9805	0.0051	0.0000
615.52	0.93	0.76	0.9807	0.0054	0.0000
615.51	0.93	0.75	0.9808	0.0057	0.0000
615.50	0.93	0.74	0.9809	0.0060	0.0000
615.49	0.92	0.73	0.9810	0.0063	0.0000
615.48	0.92	0.73	0.9812	0.0065	0.0000
615.47	0.92	0.72	0.9813	0.0068	0.0000
615.46	0.92	0.71	0.9814	0.0070	0.0000
615.45	0.92	0.70	0.9816	0.0073	0.0000
615.44	0.91	0.69	0.9817	0.0075	0.0000
615.43	0.91	0.69	0.9818	0.0078	0.0000
615.42	0.91	0.68	0.9819	0.0080	0.0000
615.41	0.91	0.67	0.9821	0.0082	0.0000
615.40	0.91	0.66	0.9822	0.0084	0.0000
615.39	0.90	0.66	0.9823	0.0086	0.0000
615.38	0.90	0.65	0.9824	0.0088	0.0000
615.37	0.90	0.64	0.9825	0.0090	0.0000
615.36	0.90	0.63	0.9827	0.0092	0.0000
615.35	0.90	0.62	0.9828	0.0094	0.0000
615.34	0.89	0.62	0.9829	0.0096	0.0000
615.33	0.89	0.61	0.9830	0.0097	0.0000
615.32	0.89	0.60	0.9831	0.0099	0.0000
615.31	0.89	0.59	0.9833	0.0100	0.0000
615.30	0.88	0.58	0.9834	0.0102	0.0000
615.29	0.88	0.58	0.9835	0.0103	0.0000
615.28	0.88	0.57	0.9836	0.0104	0.0000
615.27	0.88	0.56	0.9837	0.0106	0.0000
615.26	0.88	0.55	0.9838	0.0107	0.0000
615.25	0.87	0.55	0.9840	0.0108	0.0000
615.24	0.87	0.54	0.9841	0.0109	0.0000
615.23	0.87	0.53	0.9842	0.0110	0.0000
615.22	0.87	0.52	0.9843	0.0111	0.0000
615.21	0.87	0.51	0.9844	0.0112	0.0000
615.20	0.86	0.51	0.9845	0.0113	0.0000
615.19	0.86	0.50	0.9846	0.0114	0.0000
615.18	0.86	0.49	0.9847	0.0114	0.0000
615.17	0.86	0.48	0.9849	0.0115	0.0001
615.16	0.85	0.47	0.9850	0.0116	0.0001
615.15	0.85	0.47	0.9851	0.0116	0.0001
615.14	0.85	0.46	0.9852	0.0117	0.0001
615.13	0.85	0.45	0.9853	0.0117	0.0001
615.12	0.85	0.44	0.9854	0.0118	0.0001
615.11	0.84	0.43	0.9855	0.0118	0.0001
615.10	0.84	0.43	0.9856	0.0119	0.0001
615.09	0.84	0.42	0.9857	0.0119	0.0001
615.08	0.84	0.41	0.9858	0.0119	0.0001
615.07	0.84	0.40	0.9859	0.0119	0.0001
615.06	0.83	0.40	0.9860	0.0119	0.0001
615.05	0.83	0.39	0.9861	0.0120	0.0001
615.04	0.83	0.38	0.9863	0.0120	0.0001
615.03	0.83	0.37	0.9864	0.0120	0.0001
615.02	0.82	0.36	0.9865	0.0120	0.0001
615.01	0.82	0.36	0.9866	0.0120	0.0001
615.00	0.82	0.35	0.9867	0.0120	0.0001

$$Z_u = \rho_{ro} \beta_{ao} H_o / [\rho_{ro} \beta_{ao} - (1 - \rho_{ro}) \beta_{ow}]$$

$$= 615.67 \text{ feet}$$

where:

$$\rho_{ro} = 0.7875$$

$$\beta_{ao} = 2.98$$

$$\beta_{ow} = 2.71$$

$$H_o = 3.42 \text{ feet}$$

$$Z_{ow} = 611.14 \text{ feet}$$

$$Z_{ao} = 614.56 \text{ feet}$$

Other parameters used in calculations (from Data Entry - MWs)

$$S_m = 0.046$$

$$\alpha = 0.125 \text{ /foot}$$

$$n = 3.005$$

$$m = 0.334442596$$

$$dZ = 0.01 \text{ feet} \quad \text{Integration increment (0.01 to 1.0)}$$

$$\phi = 0.437$$

Oil Specific Volume

$$\Sigma \phi S_{of} dZ = 8.0585E-03 \text{ ft}^3/\text{ft}^2 \quad \text{Oil Specific Volume}$$

614.99	0.82	0.34	0.9868	0.0120	0.0001
614.98	0.82	0.33	0.9869	0.0119	0.0001
614.97	0.81	0.32	0.9870	0.0119	0.0001
614.96	0.81	0.32	0.9871	0.0119	0.0001
614.95	0.81	0.31	0.9872	0.0119	0.0001
614.94	0.81	0.30	0.9873	0.0118	0.0001
614.93	0.81	0.29	0.9874	0.0118	0.0001
614.92	0.80	0.29	0.9875	0.0118	0.0001
614.91	0.80	0.28	0.9876	0.0117	0.0001
614.90	0.80	0.27	0.9877	0.0117	0.0001
614.89	0.80	0.26	0.9878	0.0117	0.0001
614.88	0.80	0.25	0.9879	0.0116	0.0001
614.87	0.79	0.25	0.9879	0.0116	0.0001
614.86	0.79	0.24	0.9880	0.0115	0.0001
614.85	0.79	0.23	0.9881	0.0115	0.0001
614.84	0.79	0.22	0.9882	0.0114	0.0000
614.83	0.78	0.21	0.9883	0.0114	0.0000
614.82	0.78	0.21	0.9884	0.0113	0.0000
614.81	0.78	0.20	0.9885	0.0112	0.0000
614.80	0.78	0.19	0.9886	0.0112	0.0000
614.79	0.78	0.18	0.9887	0.0111	0.0000
614.78	0.77	0.18	0.9888	0.0110	0.0000
614.77	0.77	0.17	0.9889	0.0110	0.0000
614.76	0.77	0.16	0.9890	0.0109	0.0000
614.75	0.77	0.15	0.9891	0.0108	0.0000
614.74	0.77	0.14	0.9891	0.0108	0.0000
614.73	0.76	0.14	0.9892	0.0107	0.0000
614.72	0.76	0.13	0.9893	0.0106	0.0000
614.71	0.76	0.12	0.9894	0.0105	0.0000
614.70	0.76	0.11	0.9895	0.0105	0.0000
614.69	0.75	0.10	0.9896	0.0104	0.0000
614.68	0.75	0.10	0.9897	0.0103	0.0000
614.67	0.75	0.09	0.9898	0.0102	0.0000
614.66	0.75	0.08	0.9898	0.0101	0.0000
614.65	0.75	0.07	0.9899	0.0101	0.0000
614.64	0.74	0.06	0.9900	0.0100	0.0000
614.63	0.74	0.06	0.9901	0.0099	0.0000
614.62	0.74	0.05	0.9902	0.0098	0.0000
614.61	0.74	0.04	0.9903	0.0097	0.0000
614.60	0.74	0.03	0.9904	0.0096	0.0000
614.59	0.73	0.03	0.9904	0.0096	0.0000
614.58	0.73	0.02	0.9905	0.0095	0.0000
614.57	0.73	0.01	0.9906	0.0094	0.0000
614.56	0.73	0.00	0.9907	0.0093	0.0000
614.55	0.73	0.00	0.9908	0.0092	0.0000
614.54	0.72	0.00	0.9908	0.0092	0.0000
614.53	0.72	0.00	0.9909	0.0091	0.0000
614.52	0.72	0.00	0.9910	0.0090	0.0000
614.51	0.72	0.00	0.9911	0.0089	0.0000
614.50	0.71	0.00	0.9912	0.0088	0.0000
614.49	0.71	0.00	0.9912	0.0088	0.0000
614.48	0.71	0.00	0.9913	0.0087	0.0000
614.47	0.71	0.00	0.9914	0.0086	0.0000
614.46	0.71	0.00	0.9915	0.0085	0.0000
614.45	0.70	0.00	0.9915	0.0085	0.0000
614.44	0.70	0.00	0.9916	0.0084	0.0000
614.43	0.70	0.00	0.9917	0.0083	0.0000
614.42	0.70	0.00	0.9918	0.0082	0.0000
614.41	0.70	0.00	0.9918	0.0082	0.0000
614.40	0.69	0.00	0.9919	0.0081	0.0000
614.39	0.69	0.00	0.9920	0.0080	0.0000
614.38	0.69	0.00	0.9921	0.0079	0.0000
614.37	0.69	0.00	0.9921	0.0079	0.0000
614.36	0.68	0.00	0.9922	0.0078	0.0000
614.35	0.68	0.00	0.9923	0.0077	0.0000
614.34	0.68	0.00	0.9923	0.0077	0.0000
614.33	0.68	0.00	0.9924	0.0076	0.0000
614.32	0.68	0.00	0.9925	0.0075	0.0000
614.31	0.67	0.00	0.9926	0.0074	0.0000
614.30	0.67	0.00	0.9926	0.0074	0.0000
614.29	0.67	0.00	0.9927	0.0073	0.0000
614.28	0.67	0.00	0.9928	0.0072	0.0000
614.27	0.67	0.00	0.9928	0.0072	0.0000
614.26	0.66	0.00	0.9929	0.0071	0.0000
614.25	0.66	0.00	0.9930	0.0070	0.0000
614.24	0.66	0.00	0.9930	0.0070	0.0000
614.23	0.66	0.00	0.9931	0.0069	0.0000
614.22	0.65	0.00	0.9932	0.0068	0.0000
614.21	0.65	0.00	0.9932	0.0068	0.0000

614.20	0.65	0.00	0.9933	0.0067	0.0000
614.19	0.65	0.00	0.9934	0.0066	0.0000
614.18	0.65	0.00	0.9934	0.0066	0.0000
614.17	0.64	0.00	0.9935	0.0065	0.0000
614.16	0.64	0.00	0.9936	0.0064	0.0000
614.15	0.64	0.00	0.9936	0.0064	0.0000
614.14	0.64	0.00	0.9937	0.0063	0.0000
614.13	0.64	0.00	0.9937	0.0063	0.0000
614.12	0.63	0.00	0.9938	0.0062	0.0000
614.11	0.63	0.00	0.9939	0.0061	0.0000
614.10	0.63	0.00	0.9939	0.0061	0.0000
614.09	0.63	0.00	0.9940	0.0060	0.0000
614.08	0.63	0.00	0.9941	0.0059	0.0000
614.07	0.62	0.00	0.9941	0.0059	0.0000
614.06	0.62	0.00	0.9942	0.0058	0.0000
614.05	0.62	0.00	0.9942	0.0058	0.0000
614.04	0.62	0.00	0.9943	0.0057	0.0000
614.03	0.61	0.00	0.9944	0.0056	0.0000
614.02	0.61	0.00	0.9944	0.0056	0.0000
614.01	0.61	0.00	0.9945	0.0055	0.0000
614.00	0.61	0.00	0.9945	0.0055	0.0000
613.99	0.61	0.00	0.9946	0.0054	0.0000
613.98	0.60	0.00	0.9946	0.0054	0.0000
613.97	0.60	0.00	0.9947	0.0053	0.0000
613.96	0.60	0.00	0.9947	0.0053	0.0000
613.95	0.60	0.00	0.9948	0.0052	0.0000
613.94	0.60	0.00	0.9949	0.0051	0.0000
613.93	0.59	0.00	0.9949	0.0051	0.0000
613.92	0.59	0.00	0.9950	0.0050	0.0000
613.91	0.59	0.00	0.9950	0.0050	0.0000
613.90	0.59	0.00	0.9951	0.0049	0.0000
613.89	0.58	0.00	0.9951	0.0049	0.0000
613.88	0.58	0.00	0.9952	0.0048	0.0000
613.87	0.58	0.00	0.9952	0.0048	0.0000
613.86	0.58	0.00	0.9953	0.0047	0.0000
613.85	0.58	0.00	0.9953	0.0047	0.0000
613.84	0.57	0.00	0.9954	0.0046	0.0000
613.83	0.57	0.00	0.9954	0.0046	0.0000
613.82	0.57	0.00	0.9955	0.0045	0.0000
613.81	0.57	0.00	0.9955	0.0045	0.0000
613.80	0.57	0.00	0.9956	0.0044	0.0000
613.79	0.56	0.00	0.9956	0.0044	0.0000
613.78	0.56	0.00	0.9957	0.0043	0.0000
613.77	0.56	0.00	0.9957	0.0043	0.0000
613.76	0.56	0.00	0.9958	0.0042	0.0000
613.75	0.56	0.00	0.9958	0.0042	0.0000
613.74	0.55	0.00	0.9959	0.0041	0.0000
613.73	0.55	0.00	0.9959	0.0041	0.0000
613.72	0.55	0.00	0.9960	0.0040	0.0000
613.71	0.55	0.00	0.9960	0.0040	0.0000
613.70	0.54	0.00	0.9961	0.0039	0.0000
613.69	0.54	0.00	0.9961	0.0039	0.0000
613.68	0.54	0.00	0.9962	0.0038	0.0000
613.67	0.54	0.00	0.9962	0.0038	0.0000
613.66	0.54	0.00	0.9962	0.0038	0.0000
613.65	0.53	0.00	0.9963	0.0037	0.0000
613.64	0.53	0.00	0.9963	0.0037	0.0000
613.63	0.53	0.00	0.9964	0.0036	0.0000
613.62	0.53	0.00	0.9964	0.0036	0.0000
613.61	0.53	0.00	0.9965	0.0035	0.0000
613.60	0.52	0.00	0.9965	0.0035	0.0000
613.59	0.52	0.00	0.9965	0.0035	0.0000
613.58	0.52	0.00	0.9966	0.0034	0.0000
613.57	0.52	0.00	0.9966	0.0034	0.0000
613.56	0.51	0.00	0.9967	0.0033	0.0000
613.55	0.51	0.00	0.9967	0.0033	0.0000
613.54	0.51	0.00	0.9968	0.0032	0.0000
613.53	0.51	0.00	0.9968	0.0032	0.0000
613.52	0.51	0.00	0.9968	0.0032	0.0000
613.51	0.50	0.00	0.9969	0.0031	0.0000
613.50	0.50	0.00	0.9969	0.0031	0.0000
613.49	0.50	0.00	0.9970	0.0030	0.0000
613.48	0.50	0.00	0.9970	0.0030	0.0000
613.47	0.50	0.00	0.9970	0.0030	0.0000
613.46	0.49	0.00	0.9971	0.0029	0.0000
613.45	0.49	0.00	0.9971	0.0029	0.0000
613.44	0.49	0.00	0.9971	0.0029	0.0000
613.43	0.49	0.00	0.9972	0.0028	0.0000
613.42	0.48	0.00	0.9972	0.0028	0.0000







Data Entry Worksheet for Soil Samples -- Oil Specific Volume (OSV) Calculations

Project No. = 406 [ ] = User must enter the soil or fluid parameter, or lab data, as appropriate  
Boring Designation = MWAST-2

Soil Parameters

Fluid Parameters

Oil Parameters

Required to Estimate OSV - Soil

Required to Estimate OSV - Soil

$\rho_b = 1.59 \text{ g/cm}^3$  Bulk density of soil

$\rho_o = 0.7702 \text{ g/cm}^3$  Oil density

Soil Sample Data

Sample Intervals (maximum 21 samples)

	Feet (bgs)	to	Feet (bgs)	GRO or DRO (mg/kg)
1	[ ]		[ ]	[ ]
2	[ ]		[ ]	[ ]
3	[ ]		[ ]	[ ]
4	[ ]		[ ]	[ ]
5	[ ]		[ ]	[ ]
6	[ ]		[ ]	[ ]
7	[ ]		[ ]	[ ]
8	[ ]		[ ]	[ ]
9	[ ]		[ ]	[ ]
10	[ ]		[ ]	[ ]
11	[ ]		[ ]	[ ]
12	[ ]		[ ]	[ ]
13	[ ]		[ ]	[ ]
14	[ ]		[ ]	[ ]
15	[ ]		[ ]	[ ]
16	[ ]		[ ]	[ ]
17	[ ]		[ ]	[ ]
18	[ ]		[ ]	[ ]
19	[ ]		[ ]	[ ]
20	[ ]		[ ]	[ ]
21	[ ]		[ ]	[ ]

Deepest sample must be entered in this row

## Data Entry Worksheet for Monitoring Well Fluid Data -- Oil Specific Volume (OSV) Calculations

Project No. = 406  
Boring Designation = MWAST-2

= User must enter the soil or fluid parameter, or lab data, as appropriate

### Soil Parameters

#### Required to Estimate OSV - MWs

$\phi$  = 0.403 Total porosity  
 $\sigma_{ow}$  = 17.89 dynes/cm Oil/Water Interfacial Tension  
 $\sigma_{ao}$  = 21.82 dynes/cm Air/Oil Surface Tension  
 $\sigma_{aw}$  = 62.44 dynes/cm Air/Water Surface Tension  
 $\alpha$  = 0.268 /foot Van Genuchten mean pore-size parameter  
 $n$  = 5.85200 Van Genuchten pore-size distribution exponent  
 $S_m$  = 0.046 Irreducible water saturation

### Fluid Parameters

$\rho_{ro}$  = 0.7702 Ratio of oil to water density  
 $\beta_{ao}$  = 2.86 Ratio of water surface tension to oil surface tension  
 $\beta_{ow}$  = 3.49 Ratio of water surface tension to oil-water interfacial tension  
 $Z_{ow}$  = 16.1 feet Depth to oil/air interface  
 $Z_{ao}$  = 20.56 feet Depth to oil/water interface  
 $S_m$  = 0.046 Water saturation at field capacity  
 $\alpha$  = 0.268 /foot Van Genuchten mean pore-size parameter  
 $n$  = 5.85200 Van Genuchten pore-size distribution exponent  
 $m$  = 0.658237 Calculated from "n" (Burdine)  
 $dZ$  = 0.01 feet Integration increment (0.01 to 1.0)  
TOC = 630.72 feet Elevation of TOC or measuring point





Oil Specific Volume Calculation Spreadsheet for Free-phase Hydrocarbon in Monitoring Wells

Project No. 406  
 Boring Designation MWASt-2

**DO NOT CHANGE ANY CELLS ON THIS WORKSHEET**

Z (feet)	h <sub>ow</sub> (feet)	h <sub>ao</sub> (feet)	S <sub>w</sub> (-)	S <sub>of</sub> (-)	φ S <sub>of</sub> dZ (ft <sup>3</sup> /ft <sup>2</sup> )
Z <sub>u</sub> = 617.17	1.61	1.97	0.1673	0.0000	0.0000
617.16	1.61	1.96	0.1681	0.0014	0.0000
617.15	1.61	1.95	0.1689	0.0028	0.0000
617.14	1.60	1.94	0.1696	0.0042	0.0000
617.13	1.60	1.93	0.1704	0.0057	0.0000
617.12	1.60	1.93	0.1712	0.0072	0.0000
617.11	1.60	1.92	0.1720	0.0087	0.0000
617.10	1.60	1.91	0.1728	0.0103	0.0000
617.09	1.59	1.90	0.1736	0.0120	0.0000
617.08	1.59	1.90	0.1745	0.0137	0.0001
617.07	1.59	1.89	0.1753	0.0154	0.0001
617.06	1.59	1.88	0.1761	0.0171	0.0001
617.05	1.58	1.87	0.1770	0.0189	0.0001
617.04	1.58	1.87	0.1778	0.0208	0.0001
617.03	1.58	1.86	0.1786	0.0227	0.0001
617.02	1.58	1.85	0.1795	0.0247	0.0001
617.01	1.57	1.84	0.1804	0.0266	0.0001
617.00	1.57	1.83	0.1812	0.0287	0.0001
616.99	1.57	1.83	0.1821	0.0308	0.0001
616.98	1.57	1.82	0.1830	0.0329	0.0001
616.97	1.57	1.81	0.1838	0.0351	0.0001
616.96	1.56	1.80	0.1847	0.0374	0.0002
616.95	1.56	1.80	0.1856	0.0397	0.0002
616.94	1.56	1.79	0.1865	0.0421	0.0002
616.93	1.56	1.78	0.1874	0.0445	0.0002
616.92	1.55	1.77	0.1884	0.0470	0.0002
616.91	1.55	1.76	0.1893	0.0495	0.0002
616.90	1.55	1.76	0.1902	0.0521	0.0002
616.89	1.55	1.75	0.1911	0.0547	0.0002
616.88	1.54	1.74	0.1921	0.0575	0.0002
616.87	1.54	1.73	0.1930	0.0602	0.0002
616.86	1.54	1.73	0.1940	0.0631	0.0003
616.85	1.54	1.72	0.1950	0.0660	0.0003
616.84	1.54	1.71	0.1959	0.0689	0.0003
616.83	1.53	1.70	0.1969	0.0720	0.0003
616.82	1.53	1.70	0.1979	0.0751	0.0003
616.81	1.53	1.69	0.1989	0.0782	0.0003
616.80	1.53	1.68	0.1999	0.0815	0.0003
616.79	1.52	1.67	0.2009	0.0848	0.0003
616.78	1.52	1.66	0.2019	0.0881	0.0004
616.77	1.52	1.66	0.2029	0.0916	0.0004
616.76	1.52	1.65	0.2039	0.0951	0.0004
616.75	1.51	1.64	0.2050	0.0987	0.0004
616.74	1.51	1.63	0.2060	0.1023	0.0004
616.73	1.51	1.63	0.2070	0.1061	0.0004
616.72	1.51	1.62	0.2081	0.1099	0.0004
616.71	1.51	1.61	0.2091	0.1137	0.0005
616.70	1.50	1.60	0.2102	0.1177	0.0005
616.69	1.50	1.60	0.2113	0.1217	0.0005
616.68	1.50	1.59	0.2124	0.1258	0.0005
616.67	1.50	1.58	0.2135	0.1300	0.0005
616.66	1.49	1.57	0.2146	0.1343	0.0005
616.65	1.49	1.56	0.2157	0.1386	0.0006
616.64	1.49	1.56	0.2168	0.1430	0.0006
616.63	1.49	1.55	0.2179	0.1475	0.0006
616.62	1.48	1.54	0.2190	0.1520	0.0006
616.61	1.48	1.53	0.2202	0.1567	0.0006
616.60	1.48	1.53	0.2213	0.1614	0.0007
616.59	1.48	1.52	0.2225	0.1662	0.0007
616.58	1.48	1.51	0.2236	0.1710	0.0007
616.57	1.47	1.50	0.2248	0.1759	0.0007
616.56	1.47	1.50	0.2260	0.1810	0.0007
616.55	1.47	1.49	0.2272	0.1860	0.0007
616.54	1.47	1.48	0.2284	0.1912	0.0008
616.53	1.46	1.47	0.2296	0.1964	0.0008
616.52	1.46	1.46	0.2308	0.2017	0.0008
616.51	1.46	1.46	0.2320	0.2071	0.0008
616.50	1.46	1.45	0.2332	0.2125	0.0009

$$Z_u = \rho_{ro} \beta_{ao} H_o / [\rho_{ro} \beta_{ao} - (1 - \rho_{ro}) \beta_{ow}]$$

$$= 617.17 \text{ feet}$$

where:

$$\rho_{ro} = 0.7702$$

$$\beta_{ao} = 2.86$$

$$\beta_{ow} = 3.49$$

$$H_o = 4.46 \text{ feet}$$

$$Z_{ow} = 610.16 \text{ feet}$$

$$Z_{ao} = 614.62 \text{ feet}$$

Other parameters used in calculations (from Data Entry - MWs)

$$S_m = 0.046$$

$$\alpha = 0.268 \text{ /foot}$$

$$n = 5.852$$

$$m = 0.82911825$$

$$dZ = 0.01 \text{ feet} \quad \text{Integration increment (0.01 to 1.0)}$$

$$\phi = 0.403$$

Oil Specific Volume

$$\Sigma \phi S_{of} dZ = 4.9992E-01 \text{ ft}^3/\text{ft}^2 \quad \text{Oil Specific Volume}$$

616.49	1.45	1.44	0.2345	0.2180	0.0009
616.48	1.45	1.43	0.2357	0.2236	0.0009
616.47	1.45	1.43	0.2370	0.2292	0.0009
616.46	1.45	1.42	0.2382	0.2349	0.0009
616.45	1.45	1.41	0.2395	0.2406	0.0010
616.44	1.44	1.40	0.2408	0.2464	0.0010
616.43	1.44	1.40	0.2421	0.2523	0.0010
616.42	1.44	1.39	0.2433	0.2582	0.0010
616.41	1.44	1.38	0.2447	0.2642	0.0011
616.40	1.43	1.37	0.2460	0.2702	0.0011
616.39	1.43	1.36	0.2473	0.2762	0.0011
616.38	1.43	1.36	0.2486	0.2823	0.0011
616.37	1.43	1.35	0.2500	0.2885	0.0012
616.36	1.43	1.34	0.2513	0.2946	0.0012
616.35	1.42	1.33	0.2527	0.3008	0.0012
616.34	1.42	1.33	0.2540	0.3071	0.0012
616.33	1.42	1.32	0.2554	0.3133	0.0013
616.32	1.42	1.31	0.2568	0.3196	0.0013
616.31	1.41	1.30	0.2582	0.3259	0.0013
616.30	1.41	1.30	0.2596	0.3322	0.0013
616.29	1.41	1.29	0.2610	0.3385	0.0014
616.28	1.41	1.28	0.2624	0.3448	0.0014
616.27	1.40	1.27	0.2639	0.3511	0.0014
616.26	1.40	1.26	0.2653	0.3574	0.0014
616.25	1.40	1.26	0.2668	0.3637	0.0015
616.24	1.40	1.25	0.2682	0.3700	0.0015
616.23	1.40	1.24	0.2697	0.3763	0.0015
616.22	1.39	1.23	0.2712	0.3826	0.0015
616.21	1.39	1.23	0.2727	0.3888	0.0016
616.20	1.39	1.22	0.2742	0.3950	0.0016
616.19	1.39	1.21	0.2757	0.4011	0.0016
616.18	1.38	1.20	0.2772	0.4072	0.0016
616.17	1.38	1.20	0.2787	0.4133	0.0017
616.16	1.38	1.19	0.2803	0.4193	0.0017
616.15	1.38	1.18	0.2818	0.4253	0.0017
616.14	1.37	1.17	0.2834	0.4312	0.0017
616.13	1.37	1.16	0.2850	0.4370	0.0018
616.12	1.37	1.16	0.2866	0.4428	0.0018
616.11	1.37	1.15	0.2881	0.4485	0.0018
616.10	1.37	1.14	0.2897	0.4541	0.0018
616.09	1.36	1.13	0.2914	0.4596	0.0019
616.08	1.36	1.13	0.2930	0.4651	0.0019
616.07	1.36	1.12	0.2946	0.4704	0.0019
616.06	1.36	1.11	0.2963	0.4757	0.0019
616.05	1.35	1.10	0.2979	0.4808	0.0019
616.04	1.35	1.09	0.2996	0.4859	0.0020
616.03	1.35	1.09	0.3012	0.4909	0.0020
616.02	1.35	1.08	0.3029	0.4957	0.0020
616.01	1.34	1.07	0.3046	0.5004	0.0020
616.00	1.34	1.06	0.3063	0.5051	0.0020
615.99	1.34	1.06	0.3080	0.5096	0.0021
615.98	1.34	1.05	0.3098	0.5139	0.0021
615.97	1.34	1.04	0.3115	0.5182	0.0021
615.96	1.33	1.03	0.3133	0.5223	0.0021
615.95	1.33	1.03	0.3150	0.5263	0.0021
615.94	1.33	1.02	0.3168	0.5302	0.0021
615.93	1.33	1.01	0.3186	0.5340	0.0022
615.92	1.32	1.00	0.3204	0.5376	0.0022
615.91	1.32	0.99	0.3222	0.5411	0.0022
615.90	1.32	0.99	0.3240	0.5444	0.0022
615.89	1.32	0.98	0.3258	0.5476	0.0022
615.88	1.31	0.97	0.3276	0.5507	0.0022
615.87	1.31	0.96	0.3295	0.5537	0.0022
615.86	1.31	0.96	0.3313	0.5565	0.0022
615.85	1.31	0.95	0.3332	0.5592	0.0023
615.84	1.31	0.94	0.3351	0.5617	0.0023
615.83	1.30	0.93	0.3370	0.5641	0.0023
615.82	1.30	0.93	0.3389	0.5664	0.0023
615.81	1.30	0.92	0.3408	0.5685	0.0023
615.80	1.30	0.91	0.3427	0.5705	0.0023
615.79	1.29	0.90	0.3446	0.5724	0.0023
615.78	1.29	0.89	0.3466	0.5742	0.0023
615.77	1.29	0.89	0.3485	0.5758	0.0023
615.76	1.29	0.88	0.3505	0.5773	0.0023
615.75	1.28	0.87	0.3525	0.5786	0.0023
615.74	1.28	0.86	0.3545	0.5799	0.0023
615.73	1.28	0.86	0.3565	0.5810	0.0023
615.72	1.28	0.85	0.3585	0.5820	0.0023
615.71	1.28	0.84	0.3605	0.5828	0.0023

615.70	1.27	0.83	0.3625	0.5836	0.0024
615.69	1.27	0.83	0.3646	0.5842	0.0024
615.68	1.27	0.82	0.3666	0.5847	0.0024
615.67	1.27	0.81	0.3687	0.5852	0.0024
615.66	1.26	0.80	0.3708	0.5855	0.0024
615.65	1.26	0.79	0.3729	0.5857	0.0024
615.64	1.26	0.79	0.3750	0.5858	0.0024
615.63	1.26	0.78	0.3771	0.5857	0.0024
615.62	1.26	0.77	0.3792	0.5856	0.0024
615.61	1.25	0.76	0.3813	0.5854	0.0024
615.60	1.25	0.76	0.3835	0.5851	0.0024
615.59	1.25	0.75	0.3856	0.5847	0.0024
615.58	1.25	0.74	0.3878	0.5843	0.0024
615.57	1.24	0.73	0.3900	0.5837	0.0024
615.56	1.24	0.73	0.3922	0.5830	0.0023
615.55	1.24	0.72	0.3944	0.5823	0.0023
615.54	1.24	0.71	0.3966	0.5815	0.0023
615.53	1.23	0.70	0.3988	0.5806	0.0023
615.52	1.23	0.69	0.4010	0.5796	0.0023
615.51	1.23	0.69	0.4033	0.5786	0.0023
615.50	1.23	0.68	0.4055	0.5775	0.0023
615.49	1.23	0.67	0.4078	0.5763	0.0023
615.48	1.22	0.66	0.4101	0.5750	0.0023
615.47	1.22	0.66	0.4124	0.5737	0.0023
615.46	1.22	0.65	0.4146	0.5723	0.0023
615.45	1.22	0.64	0.4170	0.5709	0.0023
615.44	1.21	0.63	0.4193	0.5694	0.0023
615.43	1.21	0.63	0.4216	0.5678	0.0023
615.42	1.21	0.62	0.4239	0.5662	0.0023
615.41	1.21	0.61	0.4263	0.5646	0.0023
615.40	1.20	0.60	0.4287	0.5629	0.0023
615.39	1.20	0.59	0.4310	0.5611	0.0023
615.38	1.20	0.59	0.4334	0.5593	0.0023
615.37	1.20	0.58	0.4358	0.5574	0.0022
615.36	1.20	0.57	0.4382	0.5555	0.0022
615.35	1.19	0.56	0.4406	0.5536	0.0022
615.34	1.19	0.56	0.4430	0.5516	0.0022
615.33	1.19	0.55	0.4455	0.5496	0.0022
615.32	1.19	0.54	0.4479	0.5476	0.0022
615.31	1.18	0.53	0.4503	0.5455	0.0022
615.30	1.18	0.52	0.4528	0.5434	0.0022
615.29	1.18	0.52	0.4553	0.5412	0.0022
615.28	1.18	0.51	0.4578	0.5390	0.0022
615.27	1.17	0.50	0.4603	0.5368	0.0022
615.26	1.17	0.49	0.4627	0.5346	0.0022
615.25	1.17	0.49	0.4653	0.5323	0.0021
615.24	1.17	0.48	0.4678	0.5300	0.0021
615.23	1.17	0.47	0.4703	0.5277	0.0021
615.22	1.16	0.46	0.4728	0.5253	0.0021
615.21	1.16	0.46	0.4754	0.5229	0.0021
615.20	1.16	0.45	0.4779	0.5205	0.0021
615.19	1.16	0.44	0.4805	0.5181	0.0021
615.18	1.15	0.43	0.4831	0.5157	0.0021
615.17	1.15	0.42	0.4857	0.5132	0.0021
615.16	1.15	0.42	0.4882	0.5108	0.0021
615.15	1.15	0.41	0.4908	0.5083	0.0020
615.14	1.14	0.40	0.4934	0.5058	0.0020
615.13	1.14	0.39	0.4961	0.5032	0.0020
615.12	1.14	0.39	0.4987	0.5007	0.0020
615.11	1.14	0.38	0.5013	0.4981	0.0020
615.10	1.14	0.37	0.5039	0.4956	0.0020
615.09	1.13	0.36	0.5066	0.4930	0.0020
615.08	1.13	0.36	0.5092	0.4904	0.0020
615.07	1.13	0.35	0.5119	0.4878	0.0020
615.06	1.13	0.34	0.5146	0.4851	0.0020
615.05	1.12	0.33	0.5172	0.4825	0.0019
615.04	1.12	0.32	0.5199	0.4798	0.0019
615.03	1.12	0.32	0.5226	0.4772	0.0019
615.02	1.12	0.31	0.5253	0.4745	0.0019
615.01	1.11	0.30	0.5280	0.4718	0.0019
615.00	1.11	0.29	0.5307	0.4692	0.0019
614.99	1.11	0.29	0.5334	0.4665	0.0019
614.98	1.11	0.28	0.5362	0.4638	0.0019
614.97	1.11	0.27	0.5389	0.4610	0.0019
614.96	1.10	0.26	0.5416	0.4583	0.0018
614.95	1.10	0.26	0.5443	0.4556	0.0018
614.94	1.10	0.25	0.5471	0.4529	0.0018
614.93	1.10	0.24	0.5498	0.4501	0.0018
614.92	1.09	0.23	0.5526	0.4474	0.0018

614.91	1.09	0.22	0.5554	0.4446	0.0018
614.90	1.09	0.22	0.5581	0.4419	0.0018
614.89	1.09	0.21	0.5609	0.4391	0.0018
614.88	1.09	0.20	0.5637	0.4363	0.0018
614.87	1.08	0.19	0.5664	0.4336	0.0017
614.86	1.08	0.19	0.5692	0.4308	0.0017
614.85	1.08	0.18	0.5720	0.4280	0.0017
614.84	1.08	0.17	0.5748	0.4252	0.0017
614.83	1.07	0.16	0.5776	0.4224	0.0017
614.82	1.07	0.16	0.5804	0.4196	0.0017
614.81	1.07	0.15	0.5832	0.4168	0.0017
614.80	1.07	0.14	0.5860	0.4140	0.0017
614.79	1.06	0.13	0.5888	0.4112	0.0017
614.78	1.06	0.12	0.5916	0.4084	0.0016
614.77	1.06	0.12	0.5944	0.4056	0.0016
614.76	1.06	0.11	0.5972	0.4028	0.0016
614.75	1.06	0.10	0.6000	0.4000	0.0016
614.74	1.05	0.09	0.6028	0.3972	0.0016
614.73	1.05	0.09	0.6057	0.3943	0.0016
614.72	1.05	0.08	0.6085	0.3915	0.0016
614.71	1.05	0.07	0.6113	0.3887	0.0016
614.70	1.04	0.06	0.6141	0.3859	0.0016
614.69	1.04	0.06	0.6169	0.3831	0.0015
614.68	1.04	0.05	0.6198	0.3802	0.0015
614.67	1.04	0.04	0.6226	0.3774	0.0015
614.66	1.03	0.03	0.6254	0.3746	0.0015
614.65	1.03	0.02	0.6282	0.3718	0.0015
614.64	1.03	0.02	0.6310	0.3690	0.0015
614.63	1.03	0.01	0.6339	0.3661	0.0015
614.62	1.03	0.00	0.6367	0.3633	0.0015
614.61	1.02	0.00	0.6395	0.3605	0.0015
614.60	1.02	0.00	0.6423	0.3577	0.0014
614.59	1.02	0.00	0.6451	0.3549	0.0014
614.58	1.02	0.00	0.6480	0.3520	0.0014
614.57	1.01	0.00	0.6508	0.3492	0.0014
614.56	1.01	0.00	0.6536	0.3464	0.0014
614.55	1.01	0.00	0.6564	0.3436	0.0014
614.54	1.01	0.00	0.6592	0.3408	0.0014
614.53	1.00	0.00	0.6620	0.3380	0.0014
614.52	1.00	0.00	0.6648	0.3352	0.0014
614.51	1.00	0.00	0.6676	0.3324	0.0013
614.50	1.00	0.00	0.6704	0.3296	0.0013
614.49	1.00	0.00	0.6732	0.3268	0.0013
614.48	0.99	0.00	0.6760	0.3240	0.0013
614.47	0.99	0.00	0.6788	0.3212	0.0013
614.46	0.99	0.00	0.6815	0.3185	0.0013
614.45	0.99	0.00	0.6843	0.3157	0.0013
614.44	0.98	0.00	0.6871	0.3129	0.0013
614.43	0.98	0.00	0.6899	0.3101	0.0012
614.42	0.98	0.00	0.6926	0.3074	0.0012
614.41	0.98	0.00	0.6954	0.3046	0.0012
614.40	0.97	0.00	0.6981	0.3019	0.0012
614.39	0.97	0.00	0.7009	0.2991	0.0012
614.38	0.97	0.00	0.7036	0.2964	0.0012
614.37	0.97	0.00	0.7063	0.2937	0.0012
614.36	0.97	0.00	0.7090	0.2910	0.0012
614.35	0.96	0.00	0.7118	0.2882	0.0012
614.34	0.96	0.00	0.7145	0.2855	0.0012
614.33	0.96	0.00	0.7172	0.2828	0.0011
614.32	0.96	0.00	0.7199	0.2801	0.0011
614.31	0.95	0.00	0.7226	0.2774	0.0011
614.30	0.95	0.00	0.7252	0.2748	0.0011
614.29	0.95	0.00	0.7279	0.2721	0.0011
614.28	0.95	0.00	0.7306	0.2694	0.0011
614.27	0.94	0.00	0.7332	0.2668	0.0011
614.26	0.94	0.00	0.7359	0.2641	0.0011
614.25	0.94	0.00	0.7385	0.2615	0.0011
614.24	0.94	0.00	0.7411	0.2589	0.0010
614.23	0.94	0.00	0.7437	0.2563	0.0010
614.22	0.93	0.00	0.7464	0.2536	0.0010
614.21	0.93	0.00	0.7490	0.2510	0.0010
614.20	0.93	0.00	0.7515	0.2485	0.0010
614.19	0.93	0.00	0.7541	0.2459	0.0010
614.18	0.92	0.00	0.7567	0.2433	0.0010
614.17	0.92	0.00	0.7592	0.2408	0.0010
614.16	0.92	0.00	0.7618	0.2382	0.0010
614.15	0.92	0.00	0.7643	0.2357	0.0009
614.14	0.91	0.00	0.7669	0.2331	0.0009
614.13	0.91	0.00	0.7694	0.2306	0.0009

614.12	0.91	0.00	0.7719	0.2281	0.0009
614.11	0.91	0.00	0.7744	0.2256	0.0009
614.10	0.91	0.00	0.7768	0.2232	0.0009
614.09	0.90	0.00	0.7793	0.2207	0.0009
614.08	0.90	0.00	0.7818	0.2182	0.0009
614.07	0.90	0.00	0.7842	0.2158	0.0009
614.06	0.90	0.00	0.7866	0.2134	0.0009
614.05	0.89	0.00	0.7891	0.2109	0.0009
614.04	0.89	0.00	0.7915	0.2085	0.0008
614.03	0.89	0.00	0.7938	0.2062	0.0008
614.02	0.89	0.00	0.7962	0.2038	0.0008
614.01	0.89	0.00	0.7986	0.2014	0.0008
614.00	0.88	0.00	0.8009	0.1991	0.0008
613.99	0.88	0.00	0.8033	0.1967	0.0008
613.98	0.88	0.00	0.8056	0.1944	0.0008
613.97	0.88	0.00	0.8079	0.1921	0.0008
613.96	0.87	0.00	0.8102	0.1898	0.0008
613.95	0.87	0.00	0.8125	0.1875	0.0008
613.94	0.87	0.00	0.8148	0.1852	0.0007
613.93	0.87	0.00	0.8170	0.1830	0.0007
613.92	0.86	0.00	0.8193	0.1807	0.0007
613.91	0.86	0.00	0.8215	0.1785	0.0007
613.90	0.86	0.00	0.8237	0.1763	0.0007
613.89	0.86	0.00	0.8259	0.1741	0.0007
613.88	0.86	0.00	0.8281	0.1719	0.0007
613.87	0.85	0.00	0.8302	0.1698	0.0007
613.86	0.85	0.00	0.8324	0.1676	0.0007
613.85	0.85	0.00	0.8345	0.1655	0.0007
613.84	0.85	0.00	0.8366	0.1634	0.0007
613.83	0.84	0.00	0.8387	0.1613	0.0006
613.82	0.84	0.00	0.8408	0.1592	0.0006
613.81	0.84	0.00	0.8429	0.1571	0.0006
613.80	0.84	0.00	0.8450	0.1550	0.0006
613.79	0.83	0.00	0.8470	0.1530	0.0006
613.78	0.83	0.00	0.8490	0.1510	0.0006
613.77	0.83	0.00	0.8510	0.1490	0.0006
613.76	0.83	0.00	0.8530	0.1470	0.0006
613.75	0.83	0.00	0.8550	0.1450	0.0006
613.74	0.82	0.00	0.8570	0.1430	0.0006
613.73	0.82	0.00	0.8589	0.1411	0.0006
613.72	0.82	0.00	0.8609	0.1391	0.0006
613.71	0.82	0.00	0.8628	0.1372	0.0006
613.70	0.81	0.00	0.8647	0.1353	0.0005
613.69	0.81	0.00	0.8665	0.1335	0.0005
613.68	0.81	0.00	0.8684	0.1316	0.0005
613.67	0.81	0.00	0.8703	0.1297	0.0005
613.66	0.80	0.00	0.8721	0.1279	0.0005
613.65	0.80	0.00	0.8739	0.1261	0.0005
613.64	0.80	0.00	0.8757	0.1243	0.0005
613.63	0.80	0.00	0.8775	0.1225	0.0005
613.62	0.80	0.00	0.8793	0.1207	0.0005
613.61	0.79	0.00	0.8810	0.1190	0.0005
613.60	0.79	0.00	0.8827	0.1173	0.0005
613.59	0.79	0.00	0.8845	0.1155	0.0005
613.58	0.79	0.00	0.8862	0.1138	0.0005
613.57	0.78	0.00	0.8878	0.1122	0.0005
613.56	0.78	0.00	0.8895	0.1105	0.0004
613.55	0.78	0.00	0.8912	0.1088	0.0004
613.54	0.78	0.00	0.8928	0.1072	0.0004
613.53	0.77	0.00	0.8944	0.1056	0.0004
613.52	0.77	0.00	0.8960	0.1040	0.0004
613.51	0.77	0.00	0.8976	0.1024	0.0004
613.50	0.77	0.00	0.8992	0.1008	0.0004
613.49	0.77	0.00	0.9007	0.0993	0.0004
613.48	0.76	0.00	0.9023	0.0977	0.0004
613.47	0.76	0.00	0.9038	0.0962	0.0004
613.46	0.76	0.00	0.9053	0.0947	0.0004
613.45	0.76	0.00	0.9068	0.0932	0.0004
613.44	0.75	0.00	0.9083	0.0917	0.0004
613.43	0.75	0.00	0.9097	0.0903	0.0004
613.42	0.75	0.00	0.9112	0.0888	0.0004
613.41	0.75	0.00	0.9126	0.0874	0.0004
613.40	0.74	0.00	0.9140	0.0860	0.0003
613.39	0.74	0.00	0.9154	0.0846	0.0003
613.38	0.74	0.00	0.9167	0.0833	0.0003
613.37	0.74	0.00	0.9181	0.0819	0.0003
613.36	0.74	0.00	0.9195	0.0805	0.0003
613.35	0.73	0.00	0.9208	0.0792	0.0003
613.34	0.73	0.00	0.9221	0.0779	0.0003

613.33	0.73	0.00	0.9234	0.0766	0.0003
613.32	0.73	0.00	0.9247	0.0753	0.0003
613.31	0.72	0.00	0.9259	0.0741	0.0003
613.30	0.72	0.00	0.9272	0.0728	0.0003
613.29	0.72	0.00	0.9284	0.0716	0.0003
613.28	0.72	0.00	0.9296	0.0704	0.0003
613.27	0.72	0.00	0.9308	0.0692	0.0003
613.26	0.71	0.00	0.9320	0.0680	0.0003
613.25	0.71	0.00	0.9332	0.0668	0.0003
613.24	0.71	0.00	0.9344	0.0656	0.0003
613.23	0.71	0.00	0.9355	0.0645	0.0003
613.22	0.70	0.00	0.9366	0.0634	0.0003
613.21	0.70	0.00	0.9378	0.0622	0.0003
613.20	0.70	0.00	0.9389	0.0611	0.0002
613.19	0.70	0.00	0.9399	0.0601	0.0002
613.18	0.69	0.00	0.9410	0.0590	0.0002
613.17	0.69	0.00	0.9421	0.0579	0.0002
613.16	0.69	0.00	0.9431	0.0569	0.0002
613.15	0.69	0.00	0.9441	0.0559	0.0002
613.14	0.69	0.00	0.9452	0.0548	0.0002
613.13	0.68	0.00	0.9462	0.0538	0.0002
613.12	0.68	0.00	0.9472	0.0528	0.0002
613.11	0.68	0.00	0.9481	0.0519	0.0002
613.10	0.68	0.00	0.9491	0.0509	0.0002
613.09	0.67	0.00	0.9500	0.0500	0.0002
613.08	0.67	0.00	0.9510	0.0490	0.0002
613.07	0.67	0.00	0.9519	0.0481	0.0002
613.06	0.67	0.00	0.9528	0.0472	0.0002
613.05	0.66	0.00	0.9537	0.0463	0.0002
613.04	0.66	0.00	0.9546	0.0454	0.0002
613.03	0.66	0.00	0.9554	0.0446	0.0002
613.02	0.66	0.00	0.9563	0.0437	0.0002
613.01	0.66	0.00	0.9571	0.0429	0.0002
613.00	0.65	0.00	0.9580	0.0420	0.0002
612.99	0.65	0.00	0.9588	0.0412	0.0002
612.98	0.65	0.00	0.9596	0.0404	0.0002
612.97	0.65	0.00	0.9604	0.0396	0.0002
612.96	0.64	0.00	0.9612	0.0388	0.0002
612.95	0.64	0.00	0.9619	0.0381	0.0002
612.94	0.64	0.00	0.9627	0.0373	0.0002
612.93	0.64	0.00	0.9634	0.0366	0.0001
612.92	0.63	0.00	0.9642	0.0358	0.0001
612.91	0.63	0.00	0.9649	0.0351	0.0001
612.90	0.63	0.00	0.9656	0.0344	0.0001
612.89	0.63	0.00	0.9663	0.0337	0.0001
612.88	0.63	0.00	0.9670	0.0330	0.0001
612.87	0.62	0.00	0.9677	0.0323	0.0001
612.86	0.62	0.00	0.9683	0.0317	0.0001
612.85	0.62	0.00	0.9690	0.0310	0.0001
612.84	0.62	0.00	0.9696	0.0304	0.0001
612.83	0.61	0.00	0.9703	0.0297	0.0001
612.82	0.61	0.00	0.9709	0.0291	0.0001
612.81	0.61	0.00	0.9715	0.0285	0.0001
612.80	0.61	0.00	0.9721	0.0279	0.0001
612.79	0.60	0.00	0.9727	0.0273	0.0001
612.78	0.60	0.00	0.9733	0.0267	0.0001
612.77	0.60	0.00	0.9739	0.0261	0.0001
612.76	0.60	0.00	0.9744	0.0256	0.0001
612.75	0.60	0.00	0.9750	0.0250	0.0001
612.74	0.59	0.00	0.9755	0.0245	0.0001
612.73	0.59	0.00	0.9761	0.0239	0.0001
612.72	0.59	0.00	0.9766	0.0234	0.0001
612.71	0.59	0.00	0.9771	0.0229	0.0001
612.70	0.58	0.00	0.9776	0.0224	0.0001
612.69	0.58	0.00	0.9781	0.0219	0.0001
612.68	0.58	0.00	0.9786	0.0214	0.0001
612.67	0.58	0.00	0.9791	0.0209	0.0001
612.66	0.57	0.00	0.9795	0.0205	0.0001
612.65	0.57	0.00	0.9800	0.0200	0.0001
612.64	0.57	0.00	0.9805	0.0195	0.0001
612.63	0.57	0.00	0.9809	0.0191	0.0001
612.62	0.57	0.00	0.9813	0.0187	0.0001
612.61	0.56	0.00	0.9818	0.0182	0.0001
612.60	0.56	0.00	0.9822	0.0178	0.0001
612.59	0.56	0.00	0.9826	0.0174	0.0001
612.58	0.56	0.00	0.9830	0.0170	0.0001
612.57	0.55	0.00	0.9834	0.0166	0.0001
612.56	0.55	0.00	0.9838	0.0162	0.0001
612.55	0.55	0.00	0.9842	0.0158	0.0001

612.54	0.55	0.00	0.9846	0.0154	0.0001
612.53	0.54	0.00	0.9849	0.0151	0.0001
612.52	0.54	0.00	0.9853	0.0147	0.0001
612.51	0.54	0.00	0.9856	0.0144	0.0001
612.50	0.54	0.00	0.9860	0.0140	0.0001
612.49	0.54	0.00	0.9863	0.0137	0.0001
612.48	0.53	0.00	0.9867	0.0133	0.0001
612.47	0.53	0.00	0.9870	0.0130	0.0001
612.46	0.53	0.00	0.9873	0.0127	0.0001
612.45	0.53	0.00	0.9876	0.0124	0.0000
612.44	0.52	0.00	0.9879	0.0121	0.0000
612.43	0.52	0.00	0.9882	0.0118	0.0000
612.42	0.52	0.00	0.9885	0.0115	0.0000
612.41	0.52	0.00	0.9888	0.0112	0.0000
612.40	0.52	0.00	0.9891	0.0109	0.0000
612.39	0.51	0.00	0.9894	0.0106	0.0000
612.38	0.51	0.00	0.9897	0.0103	0.0000
612.37	0.51	0.00	0.9899	0.0101	0.0000
612.36	0.51	0.00	0.9902	0.0098	0.0000
612.35	0.50	0.00	0.9904	0.0096	0.0000
612.34	0.50	0.00	0.9907	0.0093	0.0000
612.33	0.50	0.00	0.9909	0.0091	0.0000
612.32	0.50	0.00	0.9912	0.0088	0.0000
612.31	0.49	0.00	0.9914	0.0086	0.0000
612.30	0.49	0.00	0.9916	0.0084	0.0000
612.29	0.49	0.00	0.9919	0.0081	0.0000
612.28	0.49	0.00	0.9921	0.0079	0.0000
612.27	0.49	0.00	0.9923	0.0077	0.0000
612.26	0.48	0.00	0.9925	0.0075	0.0000
612.25	0.48	0.00	0.9927	0.0073	0.0000
612.24	0.48	0.00	0.9929	0.0071	0.0000
612.23	0.48	0.00	0.9931	0.0069	0.0000
612.22	0.47	0.00	0.9933	0.0067	0.0000
612.21	0.47	0.00	0.9935	0.0065	0.0000
612.20	0.47	0.00	0.9937	0.0063	0.0000
612.19	0.47	0.00	0.9938	0.0062	0.0000
612.18	0.46	0.00	0.9940	0.0060	0.0000
612.17	0.46	0.00	0.9942	0.0058	0.0000
612.16	0.46	0.00	0.9944	0.0056	0.0000
612.15	0.46	0.00	0.9945	0.0055	0.0000
612.14	0.46	0.00	0.9947	0.0053	0.0000
612.13	0.45	0.00	0.9948	0.0052	0.0000
612.12	0.45	0.00	0.9950	0.0050	0.0000
612.11	0.45	0.00	0.9951	0.0049	0.0000
612.10	0.45	0.00	0.9953	0.0047	0.0000
612.09	0.44	0.00	0.9954	0.0046	0.0000
612.08	0.44	0.00	0.9955	0.0045	0.0000
612.07	0.44	0.00	0.9957	0.0043	0.0000
612.06	0.44	0.00	0.9958	0.0042	0.0000
612.05	0.43	0.00	0.9959	0.0041	0.0000
612.04	0.43	0.00	0.9961	0.0039	0.0000
612.03	0.43	0.00	0.9962	0.0038	0.0000
612.02	0.43	0.00	0.9963	0.0037	0.0000
612.01	0.43	0.00	0.9964	0.0036	0.0000
612.00	0.42	0.00	0.9965	0.0035	0.0000
611.99	0.42	0.00	0.9966	0.0034	0.0000
611.98	0.42	0.00	0.9967	0.0033	0.0000
611.97	0.42	0.00	0.9968	0.0032	0.0000
611.96	0.41	0.00	0.9969	0.0031	0.0000
611.95	0.41	0.00	0.9970	0.0030	0.0000
611.94	0.41	0.00	0.9971	0.0029	0.0000
611.93	0.41	0.00	0.9972	0.0028	0.0000
611.92	0.40	0.00	0.9973	0.0027	0.0000
611.91	0.40	0.00	0.9974	0.0026	0.0000
611.90	0.40	0.00	0.9975	0.0025	0.0000
611.89	0.40	0.00	0.9976	0.0024	0.0000
611.88	0.40	0.00	0.9977	0.0023	0.0000
611.87	0.39	0.00	0.9977	0.0023	0.0000
611.86	0.39	0.00	0.9978	0.0022	0.0000
611.85	0.39	0.00	0.9979	0.0021	0.0000
611.84	0.39	0.00	0.9980	0.0020	0.0000
611.83	0.38	0.00	0.9980	0.0020	0.0000
611.82	0.38	0.00	0.9981	0.0019	0.0000
611.81	0.38	0.00	0.9982	0.0018	0.0000
611.80	0.38	0.00	0.9982	0.0018	0.0000
611.79	0.37	0.00	0.9983	0.0017	0.0000
611.78	0.37	0.00	0.9983	0.0017	0.0000
611.77	0.37	0.00	0.9984	0.0016	0.0000
611.76	0.37	0.00	0.9985	0.0015	0.0000







	610.17	0.00	0.00	1.0000	0.0000	0.0000
	610.16	0.00	0.00	1.0000	0.0000	0.0000
Zow =	610.16	0.00	0.00	1.0000	0.0000	0.0000

Oil Specific Volume      0.4999    ft<sup>3</sup>/ft<sup>2</sup>

Data Entry Worksheet for Soil Samples -- Oil Specific Volume (OSV) Calculations

Project No. = 406   = User must enter the soil or fluid parameter, or lab data, as appropriate  
 Boring Designation = MWA6T-6

Soil Parameters

Fluid Parameters

Oil Parameters

Required to Estimate OSV - Soil

Required to Estimate OSV - Soil

$\rho_b = 1.59 \text{ g/cm}^3$  Bulk density of soil

$\rho_o = 0.7702 \text{ g/cm}^3$  Oil density

Soil Sample Data

Sample Intervals (maximum 21 samples)

	Feet (bgs)	to	Feet (bgs)	GRO or DRO (mg/kg)
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				

Deepest sample must be entered in this row

## Data Entry Worksheet for Monitoring Well Fluid Data -- Oil Specific Volume (OSV) Calculations

Project No. = 406  
Boring Designation = MWAST-6

= User must enter the soil or fluid parameter, or lab data, as appropriate

### Soil Parameters

#### Required to Estimate OSV - MWs

$\phi$  = 0.403 Total porosity  
 $\sigma_{ow}$  = 17.89 dynes/cm Oil/Water Interfacial Tension  
 $\sigma_{ao}$  = 21.82 dynes/cm Air/Oil Surface Tension  
 $\sigma_{aw}$  = 62.44 dynes/cm Air/Water Surface Tension  
 $\alpha$  = 0.312 /foot Van Genuchten mean pore-size parameter  
 $n$  = 2.10000 Van Genuchten pore-size distribution exponent  
 $S_m$  = 0.046 Irreducible water saturation

### Fluid Parameters

$\rho_{ro}$  = 0.7702 Ratio of oil to water density  
 $\beta_{ao}$  = 2.86 Ratio of water surface tension to oil surface tension  
 $\beta_{ow}$  = 3.49 Ratio of water surface tension to oil-water interfacial tension  
 $Z_{ow}$  = 17.09 feet Depth to oil/air interface  
 $Z_{ao}$  = 20.7 feet Depth to oil/water interface  
 $S_m$  = 0.046 Water saturation at field capacity  
 $\alpha$  = 0.312 /foot Van Genuchten mean pore-size parameter  
 $n$  = 2.10000 Van Genuchten pore-size distribution exponent  
 $m$  = 0.52381 Calculated from "n"  
 $dZ$  = 0.01 feet Integration increment (0.01 to 1.0)  
TOC = 632.04 feet Elevation of TOC or measuring point



Oil Specific Volume Calculation Spreadsheet for Free-phase Hydrocarbon in Monitoring Wells

Project No. 406  
 Boring Designation MWAST-6

**DO NOT CHANGE ANY CELLS ON THIS WORKSHEET**

Z (feet)	h <sub>ow</sub> (feet)	h <sub>ao</sub> (feet)	S <sub>w</sub> (-)	S <sub>of</sub> (-)	φ S <sub>of</sub> dZ (ft <sup>3</sup> /ft <sup>2</sup> )
Z <sub>u</sub> = 617.02	1.30	1.59	0.5744	0.0000	0.0000
617.01	1.30	1.58	0.5751	0.0012	0.0000
617.00	1.30	1.58	0.5758	0.0024	0.0000
616.99	1.30	1.57	0.5765	0.0037	0.0000
616.98	1.29	1.56	0.5772	0.0049	0.0000
616.97	1.29	1.55	0.5779	0.0062	0.0000
616.96	1.29	1.54	0.5786	0.0074	0.0000
616.95	1.29	1.54	0.5793	0.0087	0.0000
616.94	1.29	1.53	0.5800	0.0100	0.0000
616.93	1.28	1.52	0.5807	0.0112	0.0000
616.92	1.28	1.51	0.5814	0.0125	0.0001
616.91	1.28	1.51	0.5821	0.0138	0.0001
616.90	1.28	1.50	0.5828	0.0151	0.0001
616.89	1.27	1.49	0.5835	0.0165	0.0001
616.88	1.27	1.48	0.5842	0.0178	0.0001
616.87	1.27	1.48	0.5850	0.0191	0.0001
616.86	1.27	1.47	0.5857	0.0205	0.0001
616.85	1.27	1.46	0.5864	0.0218	0.0001
616.84	1.26	1.45	0.5871	0.0232	0.0001
616.83	1.26	1.44	0.5878	0.0246	0.0001
616.82	1.26	1.44	0.5885	0.0260	0.0001
616.81	1.26	1.43	0.5893	0.0273	0.0001
616.80	1.25	1.42	0.5900	0.0287	0.0001
616.79	1.25	1.41	0.5907	0.0301	0.0001
616.78	1.25	1.41	0.5914	0.0316	0.0001
616.77	1.25	1.40	0.5921	0.0330	0.0001
616.76	1.24	1.39	0.5929	0.0344	0.0001
616.75	1.24	1.38	0.5936	0.0359	0.0001
616.74	1.24	1.38	0.5943	0.0373	0.0002
616.73	1.24	1.37	0.5951	0.0388	0.0002
616.72	1.24	1.36	0.5958	0.0403	0.0002
616.71	1.23	1.35	0.5965	0.0417	0.0002
616.70	1.23	1.34	0.5973	0.0432	0.0002
616.69	1.23	1.34	0.5980	0.0447	0.0002
616.68	1.23	1.33	0.5987	0.0462	0.0002
616.67	1.22	1.32	0.5995	0.0477	0.0002
616.66	1.22	1.31	0.6002	0.0493	0.0002
616.65	1.22	1.31	0.6010	0.0508	0.0002
616.64	1.22	1.30	0.6017	0.0523	0.0002
616.63	1.21	1.29	0.6024	0.0539	0.0002
616.62	1.21	1.28	0.6032	0.0555	0.0002
616.61	1.21	1.27	0.6039	0.0570	0.0002
616.60	1.21	1.27	0.6047	0.0586	0.0002
616.59	1.21	1.26	0.6054	0.0602	0.0002
616.58	1.20	1.25	0.6062	0.0618	0.0002
616.57	1.20	1.24	0.6069	0.0634	0.0003
616.56	1.20	1.24	0.6077	0.0650	0.0003
616.55	1.20	1.23	0.6084	0.0666	0.0003
616.54	1.19	1.22	0.6092	0.0682	0.0003
616.53	1.19	1.21	0.6099	0.0699	0.0003
616.52	1.19	1.21	0.6107	0.0715	0.0003
616.51	1.19	1.20	0.6115	0.0732	0.0003
616.50	1.18	1.19	0.6122	0.0748	0.0003
616.49	1.18	1.18	0.6130	0.0765	0.0003
616.48	1.18	1.17	0.6138	0.0782	0.0003
616.47	1.18	1.17	0.6145	0.0799	0.0003
616.46	1.18	1.16	0.6153	0.0816	0.0003
616.45	1.17	1.15	0.6161	0.0833	0.0003
616.44	1.17	1.14	0.6168	0.0850	0.0003
616.43	1.17	1.14	0.6176	0.0867	0.0003
616.42	1.17	1.13	0.6184	0.0884	0.0004
616.41	1.16	1.12	0.6191	0.0901	0.0004
616.40	1.16	1.11	0.6199	0.0919	0.0004
616.39	1.16	1.11	0.6207	0.0936	0.0004
616.38	1.16	1.10	0.6215	0.0954	0.0004
616.37	1.15	1.09	0.6222	0.0971	0.0004
616.36	1.15	1.08	0.6230	0.0989	0.0004
616.35	1.15	1.07	0.6238	0.1007	0.0004

$$Z_u = \rho_{ro} \beta_{ao} H_o / [\rho_{ro} \beta_{ao} - (1 - \rho_{ro}) \beta_{ow}]$$

$$= 617.02 \text{ feet}$$

where:

$$\rho_{ro} = 0.7702$$

$$\beta_{ao} = 2.86$$

$$\beta_{ow} = 3.49$$

$$H_o = 3.61 \text{ feet}$$

$$Z_{ow} = 611.34 \text{ feet}$$

$$Z_{ao} = 614.95 \text{ feet}$$

Other parameters used in calculations (from Data Entry - MWs)

$$S_m = 0.046$$

$$\alpha = 0.312 \text{ /foot}$$

$$n = 2.1$$

$$m = 0.523809524$$

$$dZ = 0.01 \text{ feet} \quad \text{Integration increment (0.01 to 1.0)}$$

$$\phi = 0.403$$

Oil Specific Volume

$$\Sigma \phi S_{of} dZ = 2.7266E-01 \text{ ft}^3/\text{ft}^2 \quad \text{Oil Specific Volume}$$

616.34	1.15	1.07	0.6246	0.1024	0.0004
616.33	1.15	1.06	0.6254	0.1042	0.0004
616.32	1.14	1.05	0.6262	0.1060	0.0004
616.31	1.14	1.04	0.6270	0.1078	0.0004
616.30	1.14	1.04	0.6277	0.1096	0.0004
616.29	1.14	1.03	0.6285	0.1114	0.0004
616.28	1.13	1.02	0.6293	0.1133	0.0005
616.27	1.13	1.01	0.6301	0.1151	0.0005
616.26	1.13	1.01	0.6309	0.1169	0.0005
616.25	1.13	1.00	0.6317	0.1187	0.0005
616.24	1.12	0.99	0.6325	0.1206	0.0005
616.23	1.12	0.98	0.6333	0.1224	0.0005
616.22	1.12	0.97	0.6341	0.1243	0.0005
616.21	1.12	0.97	0.6349	0.1261	0.0005
616.20	1.12	0.96	0.6357	0.1280	0.0005
616.19	1.11	0.95	0.6365	0.1298	0.0005
616.18	1.11	0.94	0.6373	0.1317	0.0005
616.17	1.11	0.94	0.6381	0.1335	0.0005
616.16	1.11	0.93	0.6389	0.1354	0.0005
616.15	1.10	0.92	0.6397	0.1373	0.0006
616.14	1.10	0.91	0.6405	0.1391	0.0006
616.13	1.10	0.91	0.6413	0.1410	0.0006
616.12	1.10	0.90	0.6422	0.1429	0.0006
616.11	1.10	0.89	0.6430	0.1448	0.0006
616.10	1.09	0.88	0.6438	0.1467	0.0006
616.09	1.09	0.87	0.6446	0.1485	0.0006
616.08	1.09	0.87	0.6454	0.1504	0.0006
616.07	1.09	0.86	0.6462	0.1523	0.0006
616.06	1.08	0.85	0.6471	0.1542	0.0006
616.05	1.08	0.84	0.6479	0.1561	0.0006
616.04	1.08	0.84	0.6487	0.1579	0.0006
616.03	1.08	0.83	0.6495	0.1598	0.0006
616.02	1.07	0.82	0.6504	0.1617	0.0007
616.01	1.07	0.81	0.6512	0.1636	0.0007
616.00	1.07	0.81	0.6520	0.1655	0.0007
615.99	1.07	0.80	0.6529	0.1673	0.0007
615.98	1.07	0.79	0.6537	0.1692	0.0007
615.97	1.06	0.78	0.6545	0.1711	0.0007
615.96	1.06	0.77	0.6554	0.1729	0.0007
615.95	1.06	0.77	0.6562	0.1748	0.0007
615.94	1.06	0.76	0.6570	0.1767	0.0007
615.93	1.05	0.75	0.6579	0.1785	0.0007
615.92	1.05	0.74	0.6587	0.1804	0.0007
615.91	1.05	0.74	0.6595	0.1822	0.0007
615.90	1.05	0.73	0.6604	0.1841	0.0007
615.89	1.04	0.72	0.6612	0.1859	0.0007
615.88	1.04	0.71	0.6621	0.1877	0.0008
615.87	1.04	0.70	0.6629	0.1895	0.0008
615.86	1.04	0.70	0.6638	0.1913	0.0008
615.85	1.04	0.69	0.6646	0.1931	0.0008
615.84	1.03	0.68	0.6655	0.1949	0.0008
615.83	1.03	0.67	0.6663	0.1967	0.0008
615.82	1.03	0.67	0.6672	0.1985	0.0008
615.81	1.03	0.66	0.6680	0.2002	0.0008
615.80	1.02	0.65	0.6689	0.2020	0.0008
615.79	1.02	0.64	0.6697	0.2037	0.0008
615.78	1.02	0.64	0.6706	0.2055	0.0008
615.77	1.02	0.63	0.6715	0.2072	0.0008
615.76	1.01	0.62	0.6723	0.2089	0.0008
615.75	1.01	0.61	0.6732	0.2106	0.0008
615.74	1.01	0.60	0.6740	0.2122	0.0009
615.73	1.01	0.60	0.6749	0.2139	0.0009
615.72	1.01	0.59	0.6758	0.2156	0.0009
615.71	1.00	0.58	0.6766	0.2172	0.0009
615.70	1.00	0.57	0.6775	0.2188	0.0009
615.69	1.00	0.57	0.6784	0.2204	0.0009
615.68	1.00	0.56	0.6793	0.2220	0.0009
615.67	0.99	0.55	0.6801	0.2235	0.0009
615.66	0.99	0.54	0.6810	0.2251	0.0009
615.65	0.99	0.54	0.6819	0.2266	0.0009
615.64	0.99	0.53	0.6828	0.2281	0.0009
615.63	0.98	0.52	0.6836	0.2296	0.0009
615.62	0.98	0.51	0.6845	0.2311	0.0009
615.61	0.98	0.50	0.6854	0.2325	0.0009
615.60	0.98	0.50	0.6863	0.2339	0.0009
615.59	0.98	0.49	0.6872	0.2353	0.0009
615.58	0.97	0.48	0.6880	0.2367	0.0010
615.57	0.97	0.47	0.6889	0.2380	0.0010
615.56	0.97	0.47	0.6898	0.2394	0.0010



615.55	0.97	0.46	0.6907	0.2406	0.0010
615.54	0.96	0.45	0.6916	0.2419	0.0010
615.53	0.96	0.44	0.6925	0.2432	0.0010
615.52	0.96	0.44	0.6934	0.2444	0.0010
615.51	0.96	0.43	0.6943	0.2456	0.0010
615.50	0.95	0.42	0.6952	0.2467	0.0010
615.49	0.95	0.41	0.6961	0.2479	0.0010
615.48	0.95	0.40	0.6969	0.2490	0.0010
615.47	0.95	0.40	0.6978	0.2501	0.0010
615.46	0.95	0.39	0.6987	0.2511	0.0010
615.45	0.94	0.38	0.6996	0.2521	0.0010
615.44	0.94	0.37	0.7005	0.2531	0.0010
615.43	0.94	0.37	0.7014	0.2540	0.0010
615.42	0.94	0.36	0.7023	0.2550	0.0010
615.41	0.93	0.35	0.7033	0.2558	0.0010
615.40	0.93	0.34	0.7042	0.2567	0.0010
615.39	0.93	0.34	0.7051	0.2575	0.0010
615.38	0.93	0.33	0.7060	0.2583	0.0010
615.37	0.93	0.32	0.7069	0.2590	0.0010
615.36	0.92	0.31	0.7078	0.2597	0.0010
615.35	0.92	0.30	0.7087	0.2604	0.0010
615.34	0.92	0.30	0.7096	0.2610	0.0011
615.33	0.92	0.29	0.7105	0.2616	0.0011
615.32	0.91	0.28	0.7114	0.2622	0.0011
615.31	0.91	0.27	0.7124	0.2627	0.0011
615.30	0.91	0.27	0.7133	0.2632	0.0011
615.29	0.91	0.26	0.7142	0.2636	0.0011
615.28	0.90	0.25	0.7151	0.2640	0.0011
615.27	0.90	0.24	0.7160	0.2644	0.0011
615.26	0.90	0.24	0.7170	0.2647	0.0011
615.25	0.90	0.23	0.7179	0.2650	0.0011
615.24	0.90	0.22	0.7188	0.2652	0.0011
615.23	0.89	0.21	0.7197	0.2654	0.0011
615.22	0.89	0.20	0.7207	0.2656	0.0011
615.21	0.89	0.20	0.7216	0.2657	0.0011
615.20	0.89	0.19	0.7225	0.2658	0.0011
615.19	0.88	0.18	0.7234	0.2658	0.0011
615.18	0.88	0.17	0.7244	0.2658	0.0011
615.17	0.88	0.17	0.7253	0.2658	0.0011
615.16	0.88	0.16	0.7262	0.2657	0.0011
615.15	0.87	0.15	0.7272	0.2655	0.0011
615.14	0.87	0.14	0.7281	0.2654	0.0011
615.13	0.87	0.13	0.7290	0.2651	0.0011
615.12	0.87	0.13	0.7300	0.2649	0.0011
615.11	0.87	0.12	0.7309	0.2646	0.0011
615.10	0.86	0.11	0.7319	0.2642	0.0011
615.09	0.86	0.10	0.7328	0.2638	0.0011
615.08	0.86	0.10	0.7337	0.2634	0.0011
615.07	0.86	0.09	0.7347	0.2629	0.0011
615.06	0.85	0.08	0.7356	0.2624	0.0011
615.05	0.85	0.07	0.7366	0.2618	0.0011
615.04	0.85	0.07	0.7375	0.2612	0.0011
615.03	0.85	0.06	0.7385	0.2606	0.0011
615.02	0.84	0.05	0.7394	0.2599	0.0010
615.01	0.84	0.04	0.7403	0.2591	0.0010
615.00	0.84	0.03	0.7413	0.2584	0.0010
614.99	0.84	0.03	0.7422	0.2576	0.0010
614.98	0.84	0.02	0.7432	0.2567	0.0010
614.97	0.83	0.01	0.7441	0.2558	0.0010
614.96	0.83	0.00	0.7451	0.2549	0.0010
614.95	0.83	0.00	0.7460	0.2540	0.0010
614.94	0.83	0.00	0.7470	0.2530	0.0010
614.93	0.82	0.00	0.7480	0.2520	0.0010
614.92	0.82	0.00	0.7489	0.2511	0.0010
614.91	0.82	0.00	0.7499	0.2501	0.0010
614.90	0.82	0.00	0.7508	0.2492	0.0010
614.89	0.81	0.00	0.7518	0.2482	0.0010
614.88	0.81	0.00	0.7527	0.2473	0.0010
614.87	0.81	0.00	0.7537	0.2463	0.0010
614.86	0.81	0.00	0.7547	0.2453	0.0010
614.85	0.81	0.00	0.7556	0.2444	0.0010
614.84	0.80	0.00	0.7566	0.2434	0.0010
614.83	0.80	0.00	0.7575	0.2425	0.0010
614.82	0.80	0.00	0.7585	0.2415	0.0010
614.81	0.80	0.00	0.7595	0.2405	0.0010
614.80	0.79	0.00	0.7604	0.2396	0.0010
614.79	0.79	0.00	0.7614	0.2386	0.0010
614.78	0.79	0.00	0.7624	0.2376	0.0010
614.77	0.79	0.00	0.7633	0.2367	0.0010

614.76	0.78	0.00	0.7643	0.2357	0.0009
614.75	0.78	0.00	0.7653	0.2347	0.0009
614.74	0.78	0.00	0.7662	0.2338	0.0009
614.73	0.78	0.00	0.7672	0.2328	0.0009
614.72	0.78	0.00	0.7682	0.2318	0.0009
614.71	0.77	0.00	0.7691	0.2309	0.0009
614.70	0.77	0.00	0.7701	0.2299	0.0009
614.69	0.77	0.00	0.7711	0.2289	0.0009
614.68	0.77	0.00	0.7721	0.2279	0.0009
614.67	0.76	0.00	0.7730	0.2270	0.0009
614.66	0.76	0.00	0.7740	0.2260	0.0009
614.65	0.76	0.00	0.7750	0.2250	0.0009
614.64	0.76	0.00	0.7760	0.2240	0.0009
614.63	0.75	0.00	0.7769	0.2231	0.0009
614.62	0.75	0.00	0.7779	0.2221	0.0009
614.61	0.75	0.00	0.7789	0.2211	0.0009
614.60	0.75	0.00	0.7799	0.2201	0.0009
614.59	0.75	0.00	0.7808	0.2192	0.0009
614.58	0.74	0.00	0.7818	0.2182	0.0009
614.57	0.74	0.00	0.7828	0.2172	0.0009
614.56	0.74	0.00	0.7838	0.2162	0.0009
614.55	0.74	0.00	0.7848	0.2152	0.0009
614.54	0.73	0.00	0.7857	0.2143	0.0009
614.53	0.73	0.00	0.7867	0.2133	0.0009
614.52	0.73	0.00	0.7877	0.2123	0.0009
614.51	0.73	0.00	0.7887	0.2113	0.0009
614.50	0.73	0.00	0.7897	0.2103	0.0008
614.49	0.72	0.00	0.7906	0.2094	0.0008
614.48	0.72	0.00	0.7916	0.2084	0.0008
614.47	0.72	0.00	0.7926	0.2074	0.0008
614.46	0.72	0.00	0.7936	0.2064	0.0008
614.45	0.71	0.00	0.7946	0.2054	0.0008
614.44	0.71	0.00	0.7955	0.2045	0.0008
614.43	0.71	0.00	0.7965	0.2035	0.0008
614.42	0.71	0.00	0.7975	0.2025	0.0008
614.41	0.70	0.00	0.7985	0.2015	0.0008
614.40	0.70	0.00	0.7995	0.2005	0.0008
614.39	0.70	0.00	0.8005	0.1995	0.0008
614.38	0.70	0.00	0.8014	0.1986	0.0008
614.37	0.70	0.00	0.8024	0.1976	0.0008
614.36	0.69	0.00	0.8034	0.1966	0.0008
614.35	0.69	0.00	0.8044	0.1956	0.0008
614.34	0.69	0.00	0.8054	0.1946	0.0008
614.33	0.69	0.00	0.8064	0.1936	0.0008
614.32	0.68	0.00	0.8074	0.1926	0.0008
614.31	0.68	0.00	0.8083	0.1917	0.0008
614.30	0.68	0.00	0.8093	0.1907	0.0008
614.29	0.68	0.00	0.8103	0.1897	0.0008
614.28	0.67	0.00	0.8113	0.1887	0.0008
614.27	0.67	0.00	0.8123	0.1877	0.0008
614.26	0.67	0.00	0.8133	0.1867	0.0008
614.25	0.67	0.00	0.8142	0.1858	0.0007
614.24	0.67	0.00	0.8152	0.1848	0.0007
614.23	0.66	0.00	0.8162	0.1838	0.0007
614.22	0.66	0.00	0.8172	0.1828	0.0007
614.21	0.66	0.00	0.8182	0.1818	0.0007
614.20	0.66	0.00	0.8192	0.1808	0.0007
614.19	0.65	0.00	0.8202	0.1798	0.0007
614.18	0.65	0.00	0.8211	0.1789	0.0007
614.17	0.65	0.00	0.8221	0.1779	0.0007
614.16	0.65	0.00	0.8231	0.1769	0.0007
614.15	0.64	0.00	0.8241	0.1759	0.0007
614.14	0.64	0.00	0.8251	0.1749	0.0007
614.13	0.64	0.00	0.8261	0.1739	0.0007
614.12	0.64	0.00	0.8270	0.1730	0.0007
614.11	0.64	0.00	0.8280	0.1720	0.0007
614.10	0.63	0.00	0.8290	0.1710	0.0007
614.09	0.63	0.00	0.8300	0.1700	0.0007
614.08	0.63	0.00	0.8310	0.1690	0.0007
614.07	0.63	0.00	0.8320	0.1680	0.0007
614.06	0.62	0.00	0.8329	0.1671	0.0007
614.05	0.62	0.00	0.8339	0.1661	0.0007
614.04	0.62	0.00	0.8349	0.1651	0.0007
614.03	0.62	0.00	0.8359	0.1641	0.0007
614.02	0.61	0.00	0.8369	0.1631	0.0007
614.01	0.61	0.00	0.8378	0.1622	0.0007
614.00	0.61	0.00	0.8388	0.1612	0.0006
613.99	0.61	0.00	0.8398	0.1602	0.0006
613.98	0.61	0.00	0.8408	0.1592	0.0006

613.97	0.60	0.00	0.8417	0.1583	0.0006
613.96	0.60	0.00	0.8427	0.1573	0.0006
613.95	0.60	0.00	0.8437	0.1563	0.0006
613.94	0.60	0.00	0.8447	0.1553	0.0006
613.93	0.59	0.00	0.8456	0.1544	0.0006
613.92	0.59	0.00	0.8466	0.1534	0.0006
613.91	0.59	0.00	0.8476	0.1524	0.0006
613.90	0.59	0.00	0.8486	0.1514	0.0006
613.89	0.58	0.00	0.8495	0.1505	0.0006
613.88	0.58	0.00	0.8505	0.1495	0.0006
613.87	0.58	0.00	0.8515	0.1485	0.0006
613.86	0.58	0.00	0.8524	0.1476	0.0006
613.85	0.58	0.00	0.8534	0.1466	0.0006
613.84	0.57	0.00	0.8544	0.1456	0.0006
613.83	0.57	0.00	0.8553	0.1447	0.0006
613.82	0.57	0.00	0.8563	0.1437	0.0006
613.81	0.57	0.00	0.8573	0.1427	0.0006
613.80	0.56	0.00	0.8582	0.1418	0.0006
613.79	0.56	0.00	0.8592	0.1408	0.0006
613.78	0.56	0.00	0.8601	0.1399	0.0006
613.77	0.56	0.00	0.8611	0.1389	0.0006
613.76	0.56	0.00	0.8621	0.1379	0.0006
613.75	0.55	0.00	0.8630	0.1370	0.0006
613.74	0.55	0.00	0.8640	0.1360	0.0005
613.73	0.55	0.00	0.8649	0.1351	0.0005
613.72	0.55	0.00	0.8659	0.1341	0.0005
613.71	0.54	0.00	0.8668	0.1332	0.0005
613.70	0.54	0.00	0.8678	0.1322	0.0005
613.69	0.54	0.00	0.8687	0.1313	0.0005
613.68	0.54	0.00	0.8697	0.1303	0.0005
613.67	0.53	0.00	0.8706	0.1294	0.0005
613.66	0.53	0.00	0.8716	0.1284	0.0005
613.65	0.53	0.00	0.8725	0.1275	0.0005
613.64	0.53	0.00	0.8735	0.1265	0.0005
613.63	0.53	0.00	0.8744	0.1256	0.0005
613.62	0.52	0.00	0.8754	0.1246	0.0005
613.61	0.52	0.00	0.8763	0.1237	0.0005
613.60	0.52	0.00	0.8772	0.1228	0.0005
613.59	0.52	0.00	0.8782	0.1218	0.0005
613.58	0.51	0.00	0.8791	0.1209	0.0005
613.57	0.51	0.00	0.8800	0.1200	0.0005
613.56	0.51	0.00	0.8810	0.1190	0.0005
613.55	0.51	0.00	0.8819	0.1181	0.0005
613.54	0.50	0.00	0.8828	0.1172	0.0005
613.53	0.50	0.00	0.8838	0.1162	0.0005
613.52	0.50	0.00	0.8847	0.1153	0.0005
613.51	0.50	0.00	0.8856	0.1144	0.0005
613.50	0.50	0.00	0.8865	0.1135	0.0005
613.49	0.49	0.00	0.8875	0.1125	0.0005
613.48	0.49	0.00	0.8884	0.1116	0.0004
613.47	0.49	0.00	0.8893	0.1107	0.0004
613.46	0.49	0.00	0.8902	0.1098	0.0004
613.45	0.48	0.00	0.8911	0.1089	0.0004
613.44	0.48	0.00	0.8920	0.1080	0.0004
613.43	0.48	0.00	0.8929	0.1071	0.0004
613.42	0.48	0.00	0.8938	0.1062	0.0004
613.41	0.47	0.00	0.8947	0.1053	0.0004
613.40	0.47	0.00	0.8957	0.1043	0.0004
613.39	0.47	0.00	0.8966	0.1034	0.0004
613.38	0.47	0.00	0.8975	0.1025	0.0004
613.37	0.47	0.00	0.8983	0.1017	0.0004
613.36	0.46	0.00	0.8992	0.1008	0.0004
613.35	0.46	0.00	0.9001	0.0999	0.0004
613.34	0.46	0.00	0.9010	0.0990	0.0004
613.33	0.46	0.00	0.9019	0.0981	0.0004
613.32	0.45	0.00	0.9028	0.0972	0.0004
613.31	0.45	0.00	0.9037	0.0963	0.0004
613.30	0.45	0.00	0.9046	0.0954	0.0004
613.29	0.45	0.00	0.9054	0.0946	0.0004
613.28	0.44	0.00	0.9063	0.0937	0.0004
613.27	0.44	0.00	0.9072	0.0928	0.0004
613.26	0.44	0.00	0.9081	0.0919	0.0004
613.25	0.44	0.00	0.9089	0.0911	0.0004
613.24	0.44	0.00	0.9098	0.0902	0.0004
613.23	0.43	0.00	0.9107	0.0893	0.0004
613.22	0.43	0.00	0.9115	0.0885	0.0004
613.21	0.43	0.00	0.9124	0.0876	0.0004
613.20	0.43	0.00	0.9132	0.0868	0.0003
613.19	0.42	0.00	0.9141	0.0859	0.0003

613.18	0.42	0.00	0.9150	0.0850	0.0003
613.17	0.42	0.00	0.9158	0.0842	0.0003
613.16	0.42	0.00	0.9167	0.0833	0.0003
613.15	0.41	0.00	0.9175	0.0825	0.0003
613.14	0.41	0.00	0.9183	0.0817	0.0003
613.13	0.41	0.00	0.9192	0.0808	0.0003
613.12	0.41	0.00	0.9200	0.0800	0.0003
613.11	0.41	0.00	0.9208	0.0792	0.0003
613.10	0.40	0.00	0.9217	0.0783	0.0003
613.09	0.40	0.00	0.9225	0.0775	0.0003
613.08	0.40	0.00	0.9233	0.0767	0.0003
613.07	0.40	0.00	0.9241	0.0759	0.0003
613.06	0.39	0.00	0.9250	0.0750	0.0003
613.05	0.39	0.00	0.9258	0.0742	0.0003
613.04	0.39	0.00	0.9266	0.0734	0.0003
613.03	0.39	0.00	0.9274	0.0726	0.0003
613.02	0.38	0.00	0.9282	0.0718	0.0003
613.01	0.38	0.00	0.9290	0.0710	0.0003
613.00	0.38	0.00	0.9298	0.0702	0.0003
612.99	0.38	0.00	0.9306	0.0694	0.0003
612.98	0.38	0.00	0.9314	0.0686	0.0003
612.97	0.37	0.00	0.9322	0.0678	0.0003
612.96	0.37	0.00	0.9330	0.0670	0.0003
612.95	0.37	0.00	0.9337	0.0663	0.0003
612.94	0.37	0.00	0.9345	0.0655	0.0003
612.93	0.36	0.00	0.9353	0.0647	0.0003
612.92	0.36	0.00	0.9361	0.0639	0.0003
612.91	0.36	0.00	0.9368	0.0632	0.0003
612.90	0.36	0.00	0.9376	0.0624	0.0003
612.89	0.36	0.00	0.9384	0.0616	0.0002
612.88	0.35	0.00	0.9391	0.0609	0.0002
612.87	0.35	0.00	0.9399	0.0601	0.0002
612.86	0.35	0.00	0.9406	0.0594	0.0002
612.85	0.35	0.00	0.9414	0.0586	0.0002
612.84	0.34	0.00	0.9421	0.0579	0.0002
612.83	0.34	0.00	0.9429	0.0571	0.0002
612.82	0.34	0.00	0.9436	0.0564	0.0002
612.81	0.34	0.00	0.9443	0.0557	0.0002
612.80	0.33	0.00	0.9451	0.0549	0.0002
612.79	0.33	0.00	0.9458	0.0542	0.0002
612.78	0.33	0.00	0.9465	0.0535	0.0002
612.77	0.33	0.00	0.9472	0.0528	0.0002
612.76	0.33	0.00	0.9479	0.0521	0.0002
612.75	0.32	0.00	0.9487	0.0513	0.0002
612.74	0.32	0.00	0.9494	0.0506	0.0002
612.73	0.32	0.00	0.9501	0.0499	0.0002
612.72	0.32	0.00	0.9508	0.0492	0.0002
612.71	0.31	0.00	0.9515	0.0485	0.0002
612.70	0.31	0.00	0.9521	0.0479	0.0002
612.69	0.31	0.00	0.9528	0.0472	0.0002
612.68	0.31	0.00	0.9535	0.0465	0.0002
612.67	0.30	0.00	0.9542	0.0458	0.0002
612.66	0.30	0.00	0.9549	0.0451	0.0002
612.65	0.30	0.00	0.9555	0.0445	0.0002
612.64	0.30	0.00	0.9562	0.0438	0.0002
612.63	0.30	0.00	0.9569	0.0431	0.0002
612.62	0.29	0.00	0.9575	0.0425	0.0002
612.61	0.29	0.00	0.9582	0.0418	0.0002
612.60	0.29	0.00	0.9588	0.0412	0.0002
612.59	0.29	0.00	0.9595	0.0405	0.0002
612.58	0.28	0.00	0.9601	0.0399	0.0002
612.57	0.28	0.00	0.9607	0.0393	0.0002
612.56	0.28	0.00	0.9614	0.0386	0.0002
612.55	0.28	0.00	0.9620	0.0380	0.0002
612.54	0.27	0.00	0.9626	0.0374	0.0002
612.53	0.27	0.00	0.9632	0.0368	0.0001
612.52	0.27	0.00	0.9639	0.0361	0.0001
612.51	0.27	0.00	0.9645	0.0355	0.0001
612.50	0.27	0.00	0.9651	0.0349	0.0001
612.49	0.26	0.00	0.9657	0.0343	0.0001
612.48	0.26	0.00	0.9663	0.0337	0.0001
612.47	0.26	0.00	0.9668	0.0332	0.0001
612.46	0.26	0.00	0.9674	0.0326	0.0001
612.45	0.25	0.00	0.9680	0.0320	0.0001
612.44	0.25	0.00	0.9686	0.0314	0.0001
612.43	0.25	0.00	0.9692	0.0308	0.0001
612.42	0.25	0.00	0.9697	0.0303	0.0001
612.41	0.24	0.00	0.9703	0.0297	0.0001
612.40	0.24	0.00	0.9708	0.0292	0.0001

612.39	0.24	0.00	0.9714	0.0286	0.0001
612.38	0.24	0.00	0.9719	0.0281	0.0001
612.37	0.24	0.00	0.9725	0.0275	0.0001
612.36	0.23	0.00	0.9730	0.0270	0.0001
612.35	0.23	0.00	0.9736	0.0264	0.0001
612.34	0.23	0.00	0.9741	0.0259	0.0001
612.33	0.23	0.00	0.9746	0.0254	0.0001
612.32	0.22	0.00	0.9751	0.0249	0.0001
612.31	0.22	0.00	0.9756	0.0244	0.0001
612.30	0.22	0.00	0.9761	0.0239	0.0001
612.29	0.22	0.00	0.9767	0.0233	0.0001
612.28	0.21	0.00	0.9771	0.0229	0.0001
612.27	0.21	0.00	0.9776	0.0224	0.0001
612.26	0.21	0.00	0.9781	0.0219	0.0001
612.25	0.21	0.00	0.9786	0.0214	0.0001
612.24	0.21	0.00	0.9791	0.0209	0.0001
612.23	0.20	0.00	0.9796	0.0204	0.0001
612.22	0.20	0.00	0.9800	0.0200	0.0001
612.21	0.20	0.00	0.9805	0.0195	0.0001
612.20	0.20	0.00	0.9809	0.0191	0.0001
612.19	0.19	0.00	0.9814	0.0186	0.0001
612.18	0.19	0.00	0.9818	0.0182	0.0001
612.17	0.19	0.00	0.9823	0.0177	0.0001
612.16	0.19	0.00	0.9827	0.0173	0.0001
612.15	0.19	0.00	0.9832	0.0168	0.0001
612.14	0.18	0.00	0.9836	0.0164	0.0001
612.13	0.18	0.00	0.9840	0.0160	0.0001
612.12	0.18	0.00	0.9844	0.0156	0.0001
612.11	0.18	0.00	0.9848	0.0152	0.0001
612.10	0.17	0.00	0.9852	0.0148	0.0001
612.09	0.17	0.00	0.9856	0.0144	0.0001
612.08	0.17	0.00	0.9860	0.0140	0.0001
612.07	0.17	0.00	0.9864	0.0136	0.0001
612.06	0.16	0.00	0.9868	0.0132	0.0001
612.05	0.16	0.00	0.9872	0.0128	0.0001
612.04	0.16	0.00	0.9875	0.0125	0.0001
612.03	0.16	0.00	0.9879	0.0121	0.0000
612.02	0.16	0.00	0.9883	0.0117	0.0000
612.01	0.15	0.00	0.9886	0.0114	0.0000
612.00	0.15	0.00	0.9890	0.0110	0.0000
611.99	0.15	0.00	0.9893	0.0107	0.0000
611.98	0.15	0.00	0.9897	0.0103	0.0000
611.97	0.14	0.00	0.9900	0.0100	0.0000
611.96	0.14	0.00	0.9903	0.0097	0.0000
611.95	0.14	0.00	0.9906	0.0094	0.0000
611.94	0.14	0.00	0.9910	0.0090	0.0000
611.93	0.13	0.00	0.9913	0.0087	0.0000
611.92	0.13	0.00	0.9916	0.0084	0.0000
611.91	0.13	0.00	0.9919	0.0081	0.0000
611.90	0.13	0.00	0.9922	0.0078	0.0000
611.89	0.13	0.00	0.9925	0.0075	0.0000
611.88	0.12	0.00	0.9927	0.0073	0.0000
611.87	0.12	0.00	0.9930	0.0070	0.0000
611.86	0.12	0.00	0.9933	0.0067	0.0000
611.85	0.12	0.00	0.9936	0.0064	0.0000
611.84	0.11	0.00	0.9938	0.0062	0.0000
611.83	0.11	0.00	0.9941	0.0059	0.0000
611.82	0.11	0.00	0.9943	0.0057	0.0000
611.81	0.11	0.00	0.9946	0.0054	0.0000
611.80	0.10	0.00	0.9948	0.0052	0.0000
611.79	0.10	0.00	0.9951	0.0049	0.0000
611.78	0.10	0.00	0.9953	0.0047	0.0000
611.77	0.10	0.00	0.9955	0.0045	0.0000
611.76	0.10	0.00	0.9957	0.0043	0.0000
611.75	0.09	0.00	0.9959	0.0041	0.0000
611.74	0.09	0.00	0.9961	0.0039	0.0000
611.73	0.09	0.00	0.9963	0.0037	0.0000
611.72	0.09	0.00	0.9965	0.0035	0.0000
611.71	0.08	0.00	0.9967	0.0033	0.0000
611.70	0.08	0.00	0.9969	0.0031	0.0000
611.69	0.08	0.00	0.9971	0.0029	0.0000
611.68	0.08	0.00	0.9973	0.0027	0.0000
611.67	0.07	0.00	0.9974	0.0026	0.0000
611.66	0.07	0.00	0.9976	0.0024	0.0000
611.65	0.07	0.00	0.9978	0.0022	0.0000
611.64	0.07	0.00	0.9979	0.0021	0.0000
611.63	0.07	0.00	0.9981	0.0019	0.0000
611.62	0.06	0.00	0.9982	0.0018	0.0000
611.61	0.06	0.00	0.9983	0.0017	0.0000

	611.60	0.06	0.00	0.9985	0.0015	0.0000
	611.59	0.06	0.00	0.9986	0.0014	0.0000
	611.58	0.05	0.00	0.9987	0.0013	0.0000
	611.57	0.05	0.00	0.9988	0.0012	0.0000
	611.56	0.05	0.00	0.9989	0.0011	0.0000
	611.55	0.05	0.00	0.9990	0.0010	0.0000
	611.54	0.04	0.00	0.9991	0.0009	0.0000
	611.53	0.04	0.00	0.9992	0.0008	0.0000
	611.52	0.04	0.00	0.9993	0.0007	0.0000
	611.51	0.04	0.00	0.9994	0.0006	0.0000
	611.50	0.04	0.00	0.9995	0.0005	0.0000
	611.49	0.03	0.00	0.9995	0.0005	0.0000
	611.48	0.03	0.00	0.9996	0.0004	0.0000
	611.47	0.03	0.00	0.9997	0.0003	0.0000
	611.46	0.03	0.00	0.9997	0.0003	0.0000
	611.45	0.02	0.00	0.9998	0.0002	0.0000
	611.44	0.02	0.00	0.9998	0.0002	0.0000
	611.43	0.02	0.00	0.9998	0.0002	0.0000
	611.42	0.02	0.00	0.9999	0.0001	0.0000
	611.41	0.02	0.00	0.9999	0.0001	0.0000
	611.40	0.01	0.00	0.9999	0.0001	0.0000
	611.39	0.01	0.00	1.0000	0.0000	0.0000
	611.38	0.01	0.00	1.0000	0.0000	0.0000
	611.37	0.01	0.00	1.0000	0.0000	0.0000
	611.36	0.00	0.00	1.0000	0.0000	0.0000
	611.35	0.00	0.00	1.0000	0.0000	0.0000
Zow =	611.34	0.00	0.00	1.0000	0.0000	0.0000

Oil Specific Volume      0.2727    ft<sup>3</sup>/ft<sup>2</sup>

Data Entry Worksheet for Soil Samples -- Oil Specific Volume (OSV) Calculations

Project No. = 406   = User must enter the soil or fluid parameter, or lab data, as appropriate  
 Boring Designation = RW-1

Soil Parameters

Fluid Parameters

Oil Parameters

Required to Estimate OSV - Soil

Required to Estimate OSV - Soil

$\rho_b = 1.5 \text{ g/cm}^3$  Bulk density of soil

$\rho_o = 0.772 \text{ g/cm}^3$  Oil density

Soil Sample Data

Sample Intervals (maximum 21 samples)

	Feet (bgs)	to	Feet (bgs)	GRO or DRO (mg/kg)
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				

Deepest sample must be entered in this row

Data Entry Worksheet for Monitoring Well Fluid Data -- Oil Specific Volume (OSV) Calculations

Project No. = 406  
Boring Designation = RW-1

[ ] = User must enter the soil or fluid parameter, or lab data, as appropriate

Soil Parameters

Required to Estimate OSV - MWs

$\phi$  = 0.437 Total porosity  
 $\sigma_{ow}$  = 24.1 dynes/cm Oil/Water Interfacial Tension  
 $\sigma_{ao}$  = 22.6 dynes/cm Air/Oil Surface Tension  
 $\sigma_{aw}$  = 65.5 dynes/cm Air/Water Surface Tension  
 $\alpha$  = 0.125 /foot Van Genuchten mean pore-size parameter  
 $n$  = 3.00500 Van Genuchten pore-size distribution exponent  
 $S_m$  = 0.046 Irreducible water saturation

Fluid Parameters

$\rho_{ro}$  = 0.772 Ratio of oil to water density  
 $\beta_{ao}$  = 2.90 Ratio of water surface tension to oil surface tension  
 $\beta_{ow}$  = 2.72 Ratio of water surface tension to oil-water interfacial tension  
 $Z_{ow}$  = 21.84 feet Depth to oil/air interface  
 $Z_{ao}$  = 32.34 feet Depth to oil/water interface  
 $S_m$  = 0.046 Water saturation at field capacity  
 $\alpha$  = 0.125 /foot Van Genuchten mean pore-size parameter  
 $n$  = 3.00500 Van Genuchten pore-size distribution exponent  
 $m$  = 0.667221 Calculated from "n"  
 $dZ$  = 0.01 feet Integration increment (0.01 to 1.0)  
TOC = 637.5 feet Elevation of TOC or measuring point





Oil Specific Volume Calculation Spreadsheet for Free-phase Hydrocarbon in Monitoring Wells

Project No. 406  
Boring Designation RW-1

**DO NOT CHANGE ANY CELLS ON THIS WORKSHEET**

Z (feet)	$h_{ow}$ (feet)	$h_{ao}$ (feet)	$S_w$ (-)	$S_{of}$ (-)	$\phi S_{of} dZ$ (ft <sup>3</sup> /ft <sup>2</sup> )
Z <sub>u</sub> = 619.68	3.31	3.10	0.5744	0.0000	0.0000
619.67	3.31	3.10	0.5748	0.0011	0.0000
619.66	3.31	3.09	0.5753	0.0022	0.0000
619.65	3.30	3.08	0.5757	0.0034	0.0000
619.64	3.30	3.07	0.5761	0.0045	0.0000
619.63	3.30	3.07	0.5766	0.0056	0.0000
619.62	3.30	3.06	0.5770	0.0068	0.0000
619.61	3.30	3.05	0.5774	0.0079	0.0000
619.60	3.29	3.04	0.5778	0.0091	0.0000
619.59	3.29	3.04	0.5783	0.0102	0.0000
619.58	3.29	3.03	0.5787	0.0114	0.0000
619.57	3.29	3.02	0.5791	0.0125	0.0001
619.56	3.28	3.01	0.5796	0.0137	0.0001
619.55	3.28	3.00	0.5800	0.0148	0.0001
619.54	3.28	3.00	0.5804	0.0160	0.0001
619.53	3.28	2.99	0.5809	0.0171	0.0001
619.52	3.27	2.98	0.5813	0.0183	0.0001
619.51	3.27	2.97	0.5817	0.0195	0.0001
619.50	3.27	2.97	0.5822	0.0207	0.0001
619.49	3.27	2.96	0.5826	0.0218	0.0001
619.48	3.27	2.95	0.5830	0.0230	0.0001
619.47	3.26	2.94	0.5835	0.0242	0.0001
619.46	3.26	2.94	0.5839	0.0254	0.0001
619.45	3.26	2.93	0.5843	0.0266	0.0001
619.44	3.26	2.92	0.5848	0.0278	0.0001
619.43	3.25	2.91	0.5852	0.0290	0.0001
619.42	3.25	2.90	0.5856	0.0302	0.0001
619.41	3.25	2.90	0.5861	0.0314	0.0001
619.40	3.25	2.89	0.5865	0.0326	0.0001
619.39	3.24	2.88	0.5870	0.0338	0.0001
619.38	3.24	2.87	0.5874	0.0350	0.0002
619.37	3.24	2.87	0.5878	0.0362	0.0002
619.36	3.24	2.86	0.5883	0.0374	0.0002
619.35	3.24	2.85	0.5887	0.0386	0.0002
619.34	3.23	2.84	0.5891	0.0398	0.0002
619.33	3.23	2.83	0.5896	0.0411	0.0002
619.32	3.23	2.83	0.5900	0.0423	0.0002
619.31	3.23	2.82	0.5905	0.0435	0.0002
619.30	3.22	2.81	0.5909	0.0447	0.0002
619.29	3.22	2.80	0.5913	0.0460	0.0002
619.28	3.22	2.80	0.5918	0.0472	0.0002
619.27	3.22	2.79	0.5922	0.0484	0.0002
619.26	3.22	2.78	0.5926	0.0497	0.0002
619.25	3.21	2.77	0.5931	0.0509	0.0002
619.24	3.21	2.77	0.5935	0.0521	0.0002
619.23	3.21	2.76	0.5940	0.0534	0.0002
619.22	3.21	2.75	0.5944	0.0546	0.0002
619.21	3.20	2.74	0.5949	0.0559	0.0002
619.20	3.20	2.73	0.5953	0.0571	0.0002
619.19	3.20	2.73	0.5957	0.0584	0.0003
619.18	3.20	2.72	0.5962	0.0596	0.0003
619.17	3.19	2.71	0.5966	0.0609	0.0003
619.16	3.19	2.70	0.5971	0.0622	0.0003
619.15	3.19	2.70	0.5975	0.0634	0.0003
619.14	3.19	2.69	0.5979	0.0647	0.0003
619.13	3.19	2.68	0.5984	0.0659	0.0003
619.12	3.18	2.67	0.5988	0.0672	0.0003
619.11	3.18	2.66	0.5993	0.0685	0.0003
619.10	3.18	2.66	0.5997	0.0697	0.0003
619.09	3.18	2.65	0.6002	0.0710	0.0003
619.08	3.17	2.64	0.6006	0.0723	0.0003
619.07	3.17	2.63	0.6011	0.0735	0.0003
619.06	3.17	2.63	0.6015	0.0748	0.0003
619.05	3.17	2.62	0.6019	0.0761	0.0003
619.04	3.17	2.61	0.6024	0.0774	0.0003
619.03	3.16	2.60	0.6028	0.0786	0.0003
619.02	3.16	2.60	0.6033	0.0799	0.0003
619.01	3.16	2.59	0.6037	0.0812	0.0004

$$Z_u = \rho_{ro} \beta_{ao} H_o / [\rho_{ro} \beta_{ao} - (1 - \rho_{ro}) \beta_{ow}]$$

= 619.68 feet

where:

$\rho_{ro}$  = 0.772

$\beta_{ao}$  = 2.90

$\beta_{ow}$  = 2.72

$H_o$  = 10.5 feet

$Z_{ow}$  = 605.16 feet

$Z_{ao}$  = 615.66 feet

Other parameters used in calculations (from Data Entry - MWs)

$S_m$  = 0.046

$\alpha$  = 0.125 /foot

$n$  = 3.005

$m$  = 0.667221298

$dZ$  = 0.01 feet      Integration increment (0.01 to 1.0)

$\phi$  = 0.437

Oil Specific Volume

$\Sigma \phi S_{of} dZ$  = 6.5244E-01 ft<sup>3</sup>/ft<sup>2</sup>      Oil Specific Volume

619.00	3.16	2.58	0.6042	0.0825	0.0004
618.99	3.15	2.57	0.6046	0.0838	0.0004
618.98	3.15	2.56	0.6051	0.0850	0.0004
618.97	3.15	2.56	0.6055	0.0863	0.0004
618.96	3.15	2.55	0.6060	0.0876	0.0004
618.95	3.14	2.54	0.6064	0.0889	0.0004
618.94	3.14	2.53	0.6069	0.0902	0.0004
618.93	3.14	2.53	0.6073	0.0915	0.0004
618.92	3.14	2.52	0.6078	0.0928	0.0004
618.91	3.14	2.51	0.6082	0.0940	0.0004
618.90	3.13	2.50	0.6086	0.0953	0.0004
618.89	3.13	2.50	0.6091	0.0966	0.0004
618.88	3.13	2.49	0.6095	0.0979	0.0004
618.87	3.13	2.48	0.6100	0.0992	0.0004
618.86	3.12	2.47	0.6104	0.1005	0.0004
618.85	3.12	2.46	0.6109	0.1018	0.0004
618.84	3.12	2.46	0.6113	0.1031	0.0005
618.83	3.12	2.45	0.6118	0.1044	0.0005
618.82	3.11	2.44	0.6122	0.1056	0.0005
618.81	3.11	2.43	0.6127	0.1069	0.0005
618.80	3.11	2.43	0.6131	0.1082	0.0005
618.79	3.11	2.42	0.6136	0.1095	0.0005
618.78	3.11	2.41	0.6141	0.1108	0.0005
618.77	3.10	2.40	0.6145	0.1121	0.0005
618.76	3.10	2.39	0.6150	0.1134	0.0005
618.75	3.10	2.39	0.6154	0.1147	0.0005
618.74	3.10	2.38	0.6159	0.1160	0.0005
618.73	3.09	2.37	0.6163	0.1173	0.0005
618.72	3.09	2.36	0.6168	0.1185	0.0005
618.71	3.09	2.36	0.6172	0.1198	0.0005
618.70	3.09	2.35	0.6177	0.1211	0.0005
618.69	3.09	2.34	0.6181	0.1224	0.0005
618.68	3.08	2.33	0.6186	0.1237	0.0005
618.67	3.08	2.33	0.6190	0.1250	0.0005
618.66	3.08	2.32	0.6195	0.1263	0.0006
618.65	3.08	2.31	0.6199	0.1275	0.0006
618.64	3.07	2.30	0.6204	0.1288	0.0006
618.63	3.07	2.29	0.6209	0.1301	0.0006
618.62	3.07	2.29	0.6213	0.1314	0.0006
618.61	3.07	2.28	0.6218	0.1326	0.0006
618.60	3.06	2.27	0.6222	0.1339	0.0006
618.59	3.06	2.26	0.6227	0.1352	0.0006
618.58	3.06	2.26	0.6231	0.1365	0.0006
618.57	3.06	2.25	0.6236	0.1377	0.0006
618.56	3.06	2.24	0.6240	0.1390	0.0006
618.55	3.05	2.23	0.6245	0.1403	0.0006
618.54	3.05	2.22	0.6250	0.1415	0.0006
618.53	3.05	2.22	0.6254	0.1428	0.0006
618.52	3.05	2.21	0.6259	0.1441	0.0006
618.51	3.04	2.20	0.6263	0.1453	0.0006
618.50	3.04	2.19	0.6268	0.1466	0.0006
618.49	3.04	2.19	0.6272	0.1478	0.0006
618.48	3.04	2.18	0.6277	0.1491	0.0007
618.47	3.04	2.17	0.6282	0.1503	0.0007
618.46	3.03	2.16	0.6286	0.1516	0.0007
618.45	3.03	2.16	0.6291	0.1528	0.0007
618.44	3.03	2.15	0.6295	0.1541	0.0007
618.43	3.03	2.14	0.6300	0.1553	0.0007
618.42	3.02	2.13	0.6305	0.1566	0.0007
618.41	3.02	2.12	0.6309	0.1578	0.0007
618.40	3.02	2.12	0.6314	0.1590	0.0007
618.39	3.02	2.11	0.6318	0.1603	0.0007
618.38	3.01	2.10	0.6323	0.1615	0.0007
618.37	3.01	2.09	0.6328	0.1627	0.0007
618.36	3.01	2.09	0.6332	0.1639	0.0007
618.35	3.01	2.08	0.6337	0.1651	0.0007
618.34	3.01	2.07	0.6341	0.1663	0.0007
618.33	3.00	2.06	0.6346	0.1676	0.0007
618.32	3.00	2.05	0.6351	0.1688	0.0007
618.31	3.00	2.05	0.6355	0.1700	0.0007
618.30	3.00	2.04	0.6360	0.1712	0.0007
618.29	2.99	2.03	0.6365	0.1724	0.0008
618.28	2.99	2.02	0.6369	0.1735	0.0008
618.27	2.99	2.02	0.6374	0.1747	0.0008
618.26	2.99	2.01	0.6378	0.1759	0.0008
618.25	2.98	2.00	0.6383	0.1771	0.0008
618.24	2.98	1.99	0.6388	0.1783	0.0008
618.23	2.98	1.99	0.6392	0.1794	0.0008
618.22	2.98	1.98	0.6397	0.1806	0.0008

618.21	2.98	1.97	0.6402	0.1818	0.0008
618.20	2.97	1.96	0.6406	0.1829	0.0008
618.19	2.97	1.95	0.6411	0.1841	0.0008
618.18	2.97	1.95	0.6415	0.1852	0.0008
618.17	2.97	1.94	0.6420	0.1864	0.0008
618.16	2.96	1.93	0.6425	0.1875	0.0008
618.15	2.96	1.92	0.6429	0.1886	0.0008
618.14	2.96	1.92	0.6434	0.1898	0.0008
618.13	2.96	1.91	0.6439	0.1909	0.0008
618.12	2.96	1.90	0.6443	0.1920	0.0008
618.11	2.95	1.89	0.6448	0.1931	0.0008
618.10	2.95	1.89	0.6453	0.1942	0.0008
618.09	2.95	1.88	0.6457	0.1953	0.0009
618.08	2.95	1.87	0.6462	0.1964	0.0009
618.07	2.94	1.86	0.6467	0.1975	0.0009
618.06	2.94	1.85	0.6471	0.1986	0.0009
618.05	2.94	1.85	0.6476	0.1997	0.0009
618.04	2.94	1.84	0.6481	0.2008	0.0009
618.03	2.93	1.83	0.6485	0.2018	0.0009
618.02	2.93	1.82	0.6490	0.2029	0.0009
618.01	2.93	1.82	0.6495	0.2040	0.0009
618.00	2.93	1.81	0.6499	0.2050	0.0009
617.99	2.93	1.80	0.6504	0.2061	0.0009
617.98	2.92	1.79	0.6509	0.2071	0.0009
617.97	2.92	1.78	0.6513	0.2081	0.0009
617.96	2.92	1.78	0.6518	0.2092	0.0009
617.95	2.92	1.77	0.6523	0.2102	0.0009
617.94	2.91	1.76	0.6527	0.2112	0.0009
617.93	2.91	1.75	0.6532	0.2122	0.0009
617.92	2.91	1.75	0.6537	0.2132	0.0009
617.91	2.91	1.74	0.6542	0.2142	0.0009
617.90	2.91	1.73	0.6546	0.2152	0.0009
617.89	2.90	1.72	0.6551	0.2162	0.0009
617.88	2.90	1.72	0.6556	0.2172	0.0009
617.87	2.90	1.71	0.6560	0.2181	0.0010
617.86	2.90	1.70	0.6565	0.2191	0.0010
617.85	2.89	1.69	0.6570	0.2200	0.0010
617.84	2.89	1.68	0.6574	0.2210	0.0010
617.83	2.89	1.68	0.6579	0.2219	0.0010
617.82	2.89	1.67	0.6584	0.2229	0.0010
617.81	2.88	1.66	0.6589	0.2238	0.0010
617.80	2.88	1.65	0.6593	0.2247	0.0010
617.79	2.88	1.65	0.6598	0.2256	0.0010
617.78	2.88	1.64	0.6603	0.2265	0.0010
617.77	2.88	1.63	0.6607	0.2274	0.0010
617.76	2.87	1.62	0.6612	0.2283	0.0010
617.75	2.87	1.61	0.6617	0.2292	0.0010
617.74	2.87	1.61	0.6622	0.2300	0.0010
617.73	2.87	1.60	0.6626	0.2309	0.0010
617.72	2.86	1.59	0.6631	0.2318	0.0010
617.71	2.86	1.58	0.6636	0.2326	0.0010
617.70	2.86	1.58	0.6640	0.2335	0.0010
617.69	2.86	1.57	0.6645	0.2343	0.0010
617.68	2.85	1.56	0.6650	0.2351	0.0010
617.67	2.85	1.55	0.6655	0.2359	0.0010
617.66	2.85	1.55	0.6659	0.2367	0.0010
617.65	2.85	1.54	0.6664	0.2375	0.0010
617.64	2.85	1.53	0.6669	0.2383	0.0010
617.63	2.84	1.52	0.6674	0.2391	0.0010
617.62	2.84	1.51	0.6678	0.2399	0.0010
617.61	2.84	1.51	0.6683	0.2407	0.0011
617.60	2.84	1.50	0.6688	0.2414	0.0011
617.59	2.83	1.49	0.6693	0.2422	0.0011
617.58	2.83	1.48	0.6697	0.2429	0.0011
617.57	2.83	1.48	0.6702	0.2436	0.0011
617.56	2.83	1.47	0.6707	0.2444	0.0011
617.55	2.83	1.46	0.6711	0.2451	0.0011
617.54	2.82	1.45	0.6716	0.2458	0.0011
617.53	2.82	1.45	0.6721	0.2465	0.0011
617.52	2.82	1.44	0.6726	0.2472	0.0011
617.51	2.82	1.43	0.6730	0.2479	0.0011
617.50	2.81	1.42	0.6735	0.2485	0.0011
617.49	2.81	1.41	0.6740	0.2492	0.0011
617.48	2.81	1.41	0.6745	0.2499	0.0011
617.47	2.81	1.40	0.6749	0.2505	0.0011
617.46	2.80	1.39	0.6754	0.2511	0.0011
617.45	2.80	1.38	0.6759	0.2518	0.0011
617.44	2.80	1.38	0.6764	0.2524	0.0011
617.43	2.80	1.37	0.6769	0.2530	0.0011

617.42	2.80	1.36	0.6773	0.2536	0.0011
617.41	2.79	1.35	0.6778	0.2542	0.0011
617.40	2.79	1.34	0.6783	0.2548	0.0011
617.39	2.79	1.34	0.6788	0.2553	0.0011
617.38	2.79	1.33	0.6792	0.2559	0.0011
617.37	2.78	1.32	0.6797	0.2565	0.0011
617.36	2.78	1.31	0.6802	0.2570	0.0011
617.35	2.78	1.31	0.6807	0.2575	0.0011
617.34	2.78	1.30	0.6811	0.2581	0.0011
617.33	2.78	1.29	0.6816	0.2586	0.0011
617.32	2.77	1.28	0.6821	0.2591	0.0011
617.31	2.77	1.28	0.6826	0.2596	0.0011
617.30	2.77	1.27	0.6831	0.2601	0.0011
617.29	2.77	1.26	0.6835	0.2606	0.0011
617.28	2.76	1.25	0.6840	0.2610	0.0011
617.27	2.76	1.24	0.6845	0.2615	0.0011
617.26	2.76	1.24	0.6850	0.2620	0.0011
617.25	2.76	1.23	0.6854	0.2624	0.0011
617.24	2.75	1.22	0.6859	0.2628	0.0011
617.23	2.75	1.21	0.6864	0.2633	0.0012
617.22	2.75	1.21	0.6869	0.2637	0.0012
617.21	2.75	1.20	0.6874	0.2641	0.0012
617.20	2.75	1.19	0.6878	0.2645	0.0012
617.19	2.74	1.18	0.6883	0.2649	0.0012
617.18	2.74	1.17	0.6888	0.2653	0.0012
617.17	2.74	1.17	0.6893	0.2656	0.0012
617.16	2.74	1.16	0.6898	0.2660	0.0012
617.15	2.73	1.15	0.6902	0.2663	0.0012
617.14	2.73	1.14	0.6907	0.2667	0.0012
617.13	2.73	1.14	0.6912	0.2670	0.0012
617.12	2.73	1.13	0.6917	0.2673	0.0012
617.11	2.73	1.12	0.6921	0.2677	0.0012
617.10	2.72	1.11	0.6926	0.2680	0.0012
617.09	2.72	1.11	0.6931	0.2683	0.0012
617.08	2.72	1.10	0.6936	0.2685	0.0012
617.07	2.72	1.09	0.6941	0.2688	0.0012
617.06	2.71	1.08	0.6945	0.2691	0.0012
617.05	2.71	1.07	0.6950	0.2693	0.0012
617.04	2.71	1.07	0.6955	0.2696	0.0012
617.03	2.71	1.06	0.6960	0.2698	0.0012
617.02	2.70	1.05	0.6965	0.2701	0.0012
617.01	2.70	1.04	0.6969	0.2703	0.0012
617.00	2.70	1.04	0.6974	0.2705	0.0012
616.99	2.70	1.03	0.6979	0.2707	0.0012
616.98	2.70	1.02	0.6984	0.2709	0.0012
616.97	2.69	1.01	0.6989	0.2711	0.0012
616.96	2.69	1.01	0.6993	0.2713	0.0012
616.95	2.69	1.00	0.6998	0.2714	0.0012
616.94	2.69	0.99	0.7003	0.2716	0.0012
616.93	2.68	0.98	0.7008	0.2717	0.0012
616.92	2.68	0.97	0.7013	0.2719	0.0012
616.91	2.68	0.97	0.7018	0.2720	0.0012
616.90	2.68	0.96	0.7022	0.2721	0.0012
616.89	2.67	0.95	0.7027	0.2722	0.0012
616.88	2.67	0.94	0.7032	0.2723	0.0012
616.87	2.67	0.94	0.7037	0.2724	0.0012
616.86	2.67	0.93	0.7042	0.2725	0.0012
616.85	2.67	0.92	0.7046	0.2726	0.0012
616.84	2.66	0.91	0.7051	0.2727	0.0012
616.83	2.66	0.90	0.7056	0.2727	0.0012
616.82	2.66	0.90	0.7061	0.2728	0.0012
616.81	2.66	0.89	0.7066	0.2728	0.0012
616.80	2.65	0.88	0.7070	0.2729	0.0012
616.79	2.65	0.87	0.7075	0.2729	0.0012
616.78	2.65	0.87	0.7080	0.2729	0.0012
616.77	2.65	0.86	0.7085	0.2729	0.0012
616.76	2.65	0.85	0.7090	0.2729	0.0012
616.75	2.64	0.84	0.7095	0.2729	0.0012
616.74	2.64	0.84	0.7099	0.2729	0.0012
616.73	2.64	0.83	0.7104	0.2729	0.0012
616.72	2.64	0.82	0.7109	0.2729	0.0012
616.71	2.63	0.81	0.7114	0.2728	0.0012
616.70	2.63	0.80	0.7119	0.2728	0.0012
616.69	2.63	0.80	0.7123	0.2727	0.0012
616.68	2.63	0.79	0.7128	0.2727	0.0012
616.67	2.62	0.78	0.7133	0.2726	0.0012
616.66	2.62	0.77	0.7138	0.2725	0.0012
616.65	2.62	0.77	0.7143	0.2725	0.0012
616.64	2.62	0.76	0.7148	0.2724	0.0012

616.63	2.62	0.75	0.7152	0.2723	0.0012
616.62	2.61	0.74	0.7157	0.2722	0.0012
616.61	2.61	0.73	0.7162	0.2721	0.0012
616.60	2.61	0.73	0.7167	0.2719	0.0012
616.59	2.61	0.72	0.7172	0.2718	0.0012
616.58	2.60	0.71	0.7176	0.2717	0.0012
616.57	2.60	0.70	0.7181	0.2715	0.0012
616.56	2.60	0.70	0.7186	0.2714	0.0012
616.55	2.60	0.69	0.7191	0.2712	0.0012
616.54	2.60	0.68	0.7196	0.2711	0.0012
616.53	2.59	0.67	0.7201	0.2709	0.0012
616.52	2.59	0.67	0.7205	0.2707	0.0012
616.51	2.59	0.66	0.7210	0.2705	0.0012
616.50	2.59	0.65	0.7215	0.2703	0.0012
616.49	2.58	0.64	0.7220	0.2701	0.0012
616.48	2.58	0.63	0.7225	0.2699	0.0012
616.47	2.58	0.63	0.7230	0.2697	0.0012
616.46	2.58	0.62	0.7234	0.2695	0.0012
616.45	2.57	0.61	0.7239	0.2693	0.0012
616.44	2.57	0.60	0.7244	0.2691	0.0012
616.43	2.57	0.60	0.7249	0.2688	0.0012
616.42	2.57	0.59	0.7254	0.2686	0.0012
616.41	2.57	0.58	0.7258	0.2683	0.0012
616.40	2.56	0.57	0.7263	0.2681	0.0012
616.39	2.56	0.57	0.7268	0.2678	0.0012
616.38	2.56	0.56	0.7273	0.2675	0.0012
616.37	2.56	0.55	0.7278	0.2673	0.0012
616.36	2.55	0.54	0.7283	0.2670	0.0012
616.35	2.55	0.53	0.7287	0.2667	0.0012
616.34	2.55	0.53	0.7292	0.2664	0.0012
616.33	2.55	0.52	0.7297	0.2661	0.0012
616.32	2.54	0.51	0.7302	0.2658	0.0012
616.31	2.54	0.50	0.7307	0.2655	0.0012
616.30	2.54	0.50	0.7312	0.2652	0.0012
616.29	2.54	0.49	0.7316	0.2649	0.0012
616.28	2.54	0.48	0.7321	0.2646	0.0012
616.27	2.53	0.47	0.7326	0.2643	0.0012
616.26	2.53	0.46	0.7331	0.2639	0.0012
616.25	2.53	0.46	0.7336	0.2636	0.0012
616.24	2.53	0.45	0.7340	0.2632	0.0012
616.23	2.52	0.44	0.7345	0.2629	0.0011
616.22	2.52	0.43	0.7350	0.2626	0.0011
616.21	2.52	0.43	0.7355	0.2622	0.0011
616.20	2.52	0.42	0.7360	0.2618	0.0011
616.19	2.52	0.41	0.7365	0.2615	0.0011
616.18	2.51	0.40	0.7369	0.2611	0.0011
616.17	2.51	0.40	0.7374	0.2607	0.0011
616.16	2.51	0.39	0.7379	0.2604	0.0011
616.15	2.51	0.38	0.7384	0.2600	0.0011
616.14	2.50	0.37	0.7389	0.2596	0.0011
616.13	2.50	0.36	0.7393	0.2592	0.0011
616.12	2.50	0.36	0.7398	0.2588	0.0011
616.11	2.50	0.35	0.7403	0.2584	0.0011
616.10	2.49	0.34	0.7408	0.2580	0.0011
616.09	2.49	0.33	0.7413	0.2576	0.0011
616.08	2.49	0.33	0.7418	0.2572	0.0011
616.07	2.49	0.32	0.7422	0.2568	0.0011
616.06	2.49	0.31	0.7427	0.2564	0.0011
616.05	2.48	0.30	0.7432	0.2560	0.0011
616.04	2.48	0.29	0.7437	0.2556	0.0011
616.03	2.48	0.29	0.7442	0.2551	0.0011
616.02	2.48	0.28	0.7446	0.2547	0.0011
616.01	2.47	0.27	0.7451	0.2543	0.0011
616.00	2.47	0.26	0.7456	0.2538	0.0011
615.99	2.47	0.26	0.7461	0.2534	0.0011
615.98	2.47	0.25	0.7466	0.2530	0.0011
615.97	2.47	0.24	0.7470	0.2525	0.0011
615.96	2.46	0.23	0.7475	0.2521	0.0011
615.95	2.46	0.23	0.7480	0.2517	0.0011
615.94	2.46	0.22	0.7485	0.2512	0.0011
615.93	2.46	0.21	0.7490	0.2508	0.0011
615.92	2.45	0.20	0.7494	0.2503	0.0011
615.91	2.45	0.19	0.7499	0.2499	0.0011
615.90	2.45	0.19	0.7504	0.2494	0.0011
615.89	2.45	0.18	0.7509	0.2489	0.0011
615.88	2.44	0.17	0.7514	0.2485	0.0011
615.87	2.44	0.16	0.7518	0.2480	0.0011
615.86	2.44	0.16	0.7523	0.2476	0.0011
615.85	2.44	0.15	0.7528	0.2471	0.0011

615.84	2.44	0.14	0.7533	0.2466	0.0011
615.83	2.43	0.13	0.7538	0.2462	0.0011
615.82	2.43	0.12	0.7542	0.2457	0.0011
615.81	2.43	0.12	0.7547	0.2452	0.0011
615.80	2.43	0.11	0.7552	0.2448	0.0011
615.79	2.42	0.10	0.7557	0.2443	0.0011
615.78	2.42	0.09	0.7562	0.2438	0.0011
615.77	2.42	0.09	0.7566	0.2433	0.0011
615.76	2.42	0.08	0.7571	0.2429	0.0011
615.75	2.41	0.07	0.7576	0.2424	0.0011
615.74	2.41	0.06	0.7581	0.2419	0.0011
615.73	2.41	0.06	0.7586	0.2414	0.0011
615.72	2.41	0.05	0.7590	0.2410	0.0011
615.71	2.41	0.04	0.7595	0.2405	0.0011
615.70	2.40	0.03	0.7600	0.2400	0.0010
615.69	2.40	0.02	0.7605	0.2395	0.0010
615.68	2.40	0.02	0.7610	0.2390	0.0010
615.67	2.40	0.01	0.7614	0.2386	0.0010
615.66	2.39	0.00	0.7619	0.2381	0.0010
615.65	2.39	0.00	0.7624	0.2376	0.0010
615.64	2.39	0.00	0.7629	0.2371	0.0010
615.63	2.39	0.00	0.7633	0.2367	0.0010
615.62	2.39	0.00	0.7638	0.2362	0.0010
615.61	2.38	0.00	0.7643	0.2357	0.0010
615.60	2.38	0.00	0.7648	0.2352	0.0010
615.59	2.38	0.00	0.7653	0.2347	0.0010
615.58	2.38	0.00	0.7657	0.2343	0.0010
615.57	2.37	0.00	0.7662	0.2338	0.0010
615.56	2.37	0.00	0.7667	0.2333	0.0010
615.55	2.37	0.00	0.7672	0.2328	0.0010
615.54	2.37	0.00	0.7676	0.2324	0.0010
615.53	2.36	0.00	0.7681	0.2319	0.0010
615.52	2.36	0.00	0.7686	0.2314	0.0010
615.51	2.36	0.00	0.7691	0.2309	0.0010
615.50	2.36	0.00	0.7695	0.2305	0.0010
615.49	2.36	0.00	0.7700	0.2300	0.0010
615.48	2.35	0.00	0.7705	0.2295	0.0010
615.47	2.35	0.00	0.7710	0.2290	0.0010
615.46	2.35	0.00	0.7714	0.2286	0.0010
615.45	2.35	0.00	0.7719	0.2281	0.0010
615.44	2.34	0.00	0.7724	0.2276	0.0010
615.43	2.34	0.00	0.7729	0.2271	0.0010
615.42	2.34	0.00	0.7733	0.2267	0.0010
615.41	2.34	0.00	0.7738	0.2262	0.0010
615.40	2.34	0.00	0.7743	0.2257	0.0010
615.39	2.33	0.00	0.7748	0.2252	0.0010
615.38	2.33	0.00	0.7752	0.2248	0.0010
615.37	2.33	0.00	0.7757	0.2243	0.0010
615.36	2.33	0.00	0.7762	0.2238	0.0010
615.35	2.32	0.00	0.7767	0.2233	0.0010
615.34	2.32	0.00	0.7771	0.2229	0.0010
615.33	2.32	0.00	0.7776	0.2224	0.0010
615.32	2.32	0.00	0.7781	0.2219	0.0010
615.31	2.31	0.00	0.7786	0.2214	0.0010
615.30	2.31	0.00	0.7790	0.2210	0.0010
615.29	2.31	0.00	0.7795	0.2205	0.0010
615.28	2.31	0.00	0.7800	0.2200	0.0010
615.27	2.31	0.00	0.7804	0.2196	0.0010
615.26	2.30	0.00	0.7809	0.2191	0.0010
615.25	2.30	0.00	0.7814	0.2186	0.0010
615.24	2.30	0.00	0.7819	0.2181	0.0010
615.23	2.30	0.00	0.7823	0.2177	0.0010
615.22	2.29	0.00	0.7828	0.2172	0.0009
615.21	2.29	0.00	0.7833	0.2167	0.0009
615.20	2.29	0.00	0.7837	0.2163	0.0009
615.19	2.29	0.00	0.7842	0.2158	0.0009
615.18	2.28	0.00	0.7847	0.2153	0.0009
615.17	2.28	0.00	0.7852	0.2148	0.0009
615.16	2.28	0.00	0.7856	0.2144	0.0009
615.15	2.28	0.00	0.7861	0.2139	0.0009
615.14	2.28	0.00	0.7866	0.2134	0.0009
615.13	2.27	0.00	0.7870	0.2130	0.0009
615.12	2.27	0.00	0.7875	0.2125	0.0009
615.11	2.27	0.00	0.7880	0.2120	0.0009
615.10	2.27	0.00	0.7884	0.2116	0.0009
615.09	2.26	0.00	0.7889	0.2111	0.0009
615.08	2.26	0.00	0.7894	0.2106	0.0009
615.07	2.26	0.00	0.7899	0.2101	0.0009
615.06	2.26	0.00	0.7903	0.2097	0.0009

615.05	2.26	0.00	0.7908	0.2092	0.0009
615.04	2.25	0.00	0.7913	0.2087	0.0009
615.03	2.25	0.00	0.7917	0.2083	0.0009
615.02	2.25	0.00	0.7922	0.2078	0.0009
615.01	2.25	0.00	0.7927	0.2073	0.0009
615.00	2.24	0.00	0.7931	0.2069	0.0009
614.99	2.24	0.00	0.7936	0.2064	0.0009
614.98	2.24	0.00	0.7941	0.2059	0.0009
614.97	2.24	0.00	0.7945	0.2055	0.0009
614.96	2.23	0.00	0.7950	0.2050	0.0009
614.95	2.23	0.00	0.7955	0.2045	0.0009
614.94	2.23	0.00	0.7959	0.2041	0.0009
614.93	2.23	0.00	0.7964	0.2036	0.0009
614.92	2.23	0.00	0.7969	0.2031	0.0009
614.91	2.22	0.00	0.7973	0.2027	0.0009
614.90	2.22	0.00	0.7978	0.2022	0.0009
614.89	2.22	0.00	0.7982	0.2018	0.0009
614.88	2.22	0.00	0.7987	0.2013	0.0009
614.87	2.21	0.00	0.7992	0.2008	0.0009
614.86	2.21	0.00	0.7996	0.2004	0.0009
614.85	2.21	0.00	0.8001	0.1999	0.0009
614.84	2.21	0.00	0.8006	0.1994	0.0009
614.83	2.21	0.00	0.8010	0.1990	0.0009
614.82	2.20	0.00	0.8015	0.1985	0.0009
614.81	2.20	0.00	0.8020	0.1980	0.0009
614.80	2.20	0.00	0.8024	0.1976	0.0009
614.79	2.20	0.00	0.8029	0.1971	0.0009
614.78	2.19	0.00	0.8033	0.1967	0.0009
614.77	2.19	0.00	0.8038	0.1962	0.0009
614.76	2.19	0.00	0.8043	0.1957	0.0009
614.75	2.19	0.00	0.8047	0.1953	0.0009
614.74	2.18	0.00	0.8052	0.1948	0.0009
614.73	2.18	0.00	0.8056	0.1944	0.0008
614.72	2.18	0.00	0.8061	0.1939	0.0008
614.71	2.18	0.00	0.8066	0.1934	0.0008
614.70	2.18	0.00	0.8070	0.1930	0.0008
614.69	2.17	0.00	0.8075	0.1925	0.0008
614.68	2.17	0.00	0.8079	0.1921	0.0008
614.67	2.17	0.00	0.8084	0.1916	0.0008
614.66	2.17	0.00	0.8089	0.1911	0.0008
614.65	2.16	0.00	0.8093	0.1907	0.0008
614.64	2.16	0.00	0.8098	0.1902	0.0008
614.63	2.16	0.00	0.8102	0.1898	0.0008
614.62	2.16	0.00	0.8107	0.1893	0.0008
614.61	2.16	0.00	0.8111	0.1889	0.0008
614.60	2.15	0.00	0.8116	0.1884	0.0008
614.59	2.15	0.00	0.8121	0.1879	0.0008
614.58	2.15	0.00	0.8125	0.1875	0.0008
614.57	2.15	0.00	0.8130	0.1870	0.0008
614.56	2.14	0.00	0.8134	0.1866	0.0008
614.55	2.14	0.00	0.8139	0.1861	0.0008
614.54	2.14	0.00	0.8143	0.1857	0.0008
614.53	2.14	0.00	0.8148	0.1852	0.0008
614.52	2.13	0.00	0.8152	0.1848	0.0008
614.51	2.13	0.00	0.8157	0.1843	0.0008
614.50	2.13	0.00	0.8162	0.1838	0.0008
614.49	2.13	0.00	0.8166	0.1834	0.0008
614.48	2.13	0.00	0.8171	0.1829	0.0008
614.47	2.12	0.00	0.8175	0.1825	0.0008
614.46	2.12	0.00	0.8180	0.1820	0.0008
614.45	2.12	0.00	0.8184	0.1816	0.0008
614.44	2.12	0.00	0.8189	0.1811	0.0008
614.43	2.11	0.00	0.8193	0.1807	0.0008
614.42	2.11	0.00	0.8198	0.1802	0.0008
614.41	2.11	0.00	0.8202	0.1798	0.0008
614.40	2.11	0.00	0.8207	0.1793	0.0008
614.39	2.10	0.00	0.8211	0.1789	0.0008
614.38	2.10	0.00	0.8216	0.1784	0.0008
614.37	2.10	0.00	0.8220	0.1780	0.0008
614.36	2.10	0.00	0.8225	0.1775	0.0008
614.35	2.10	0.00	0.8229	0.1771	0.0008
614.34	2.09	0.00	0.8234	0.1766	0.0008
614.33	2.09	0.00	0.8238	0.1762	0.0008
614.32	2.09	0.00	0.8243	0.1757	0.0008
614.31	2.09	0.00	0.8247	0.1753	0.0008
614.30	2.08	0.00	0.8252	0.1748	0.0008
614.29	2.08	0.00	0.8256	0.1744	0.0008
614.28	2.08	0.00	0.8261	0.1739	0.0008
614.27	2.08	0.00	0.8265	0.1735	0.0008



614.26	2.08	0.00	0.8270	0.1730	0.0008
614.25	2.07	0.00	0.8274	0.1726	0.0008
614.24	2.07	0.00	0.8278	0.1722	0.0008
614.23	2.07	0.00	0.8283	0.1717	0.0008
614.22	2.07	0.00	0.8287	0.1713	0.0007
614.21	2.06	0.00	0.8292	0.1708	0.0007
614.20	2.06	0.00	0.8296	0.1704	0.0007
614.19	2.06	0.00	0.8301	0.1699	0.0007
614.18	2.06	0.00	0.8305	0.1695	0.0007
614.17	2.05	0.00	0.8310	0.1690	0.0007
614.16	2.05	0.00	0.8314	0.1686	0.0007
614.15	2.05	0.00	0.8318	0.1682	0.0007
614.14	2.05	0.00	0.8323	0.1677	0.0007
614.13	2.05	0.00	0.8327	0.1673	0.0007
614.12	2.04	0.00	0.8332	0.1668	0.0007
614.11	2.04	0.00	0.8336	0.1664	0.0007
614.10	2.04	0.00	0.8340	0.1660	0.0007
614.09	2.04	0.00	0.8345	0.1655	0.0007
614.08	2.03	0.00	0.8349	0.1651	0.0007
614.07	2.03	0.00	0.8354	0.1646	0.0007
614.06	2.03	0.00	0.8358	0.1642	0.0007
614.05	2.03	0.00	0.8362	0.1638	0.0007
614.04	2.03	0.00	0.8367	0.1633	0.0007
614.03	2.02	0.00	0.8371	0.1629	0.0007
614.02	2.02	0.00	0.8376	0.1624	0.0007
614.01	2.02	0.00	0.8380	0.1620	0.0007
614.00	2.02	0.00	0.8384	0.1616	0.0007
613.99	2.01	0.00	0.8389	0.1611	0.0007
613.98	2.01	0.00	0.8393	0.1607	0.0007
613.97	2.01	0.00	0.8397	0.1603	0.0007
613.96	2.01	0.00	0.8402	0.1598	0.0007
613.95	2.00	0.00	0.8406	0.1594	0.0007
613.94	2.00	0.00	0.8410	0.1590	0.0007
613.93	2.00	0.00	0.8415	0.1585	0.0007
613.92	2.00	0.00	0.8419	0.1581	0.0007
613.91	2.00	0.00	0.8423	0.1577	0.0007
613.90	1.99	0.00	0.8428	0.1572	0.0007
613.89	1.99	0.00	0.8432	0.1568	0.0007
613.88	1.99	0.00	0.8436	0.1564	0.0007
613.87	1.99	0.00	0.8441	0.1559	0.0007
613.86	1.98	0.00	0.8445	0.1555	0.0007
613.85	1.98	0.00	0.8449	0.1551	0.0007
613.84	1.98	0.00	0.8454	0.1546	0.0007
613.83	1.98	0.00	0.8458	0.1542	0.0007
613.82	1.97	0.00	0.8462	0.1538	0.0007
613.81	1.97	0.00	0.8466	0.1534	0.0007
613.80	1.97	0.00	0.8471	0.1529	0.0007
613.79	1.97	0.00	0.8475	0.1525	0.0007
613.78	1.97	0.00	0.8479	0.1521	0.0007
613.77	1.96	0.00	0.8484	0.1516	0.0007
613.76	1.96	0.00	0.8488	0.1512	0.0007
613.75	1.96	0.00	0.8492	0.1508	0.0007
613.74	1.96	0.00	0.8496	0.1504	0.0007
613.73	1.95	0.00	0.8501	0.1499	0.0007
613.72	1.95	0.00	0.8505	0.1495	0.0007
613.71	1.95	0.00	0.8509	0.1491	0.0007
613.70	1.95	0.00	0.8513	0.1487	0.0006
613.69	1.95	0.00	0.8518	0.1482	0.0006
613.68	1.94	0.00	0.8522	0.1478	0.0006
613.67	1.94	0.00	0.8526	0.1474	0.0006
613.66	1.94	0.00	0.8530	0.1470	0.0006
613.65	1.94	0.00	0.8534	0.1466	0.0006
613.64	1.93	0.00	0.8539	0.1461	0.0006
613.63	1.93	0.00	0.8543	0.1457	0.0006
613.62	1.93	0.00	0.8547	0.1453	0.0006
613.61	1.93	0.00	0.8551	0.1449	0.0006
613.60	1.92	0.00	0.8555	0.1445	0.0006
613.59	1.92	0.00	0.8560	0.1440	0.0006
613.58	1.92	0.00	0.8564	0.1436	0.0006
613.57	1.92	0.00	0.8568	0.1432	0.0006
613.56	1.92	0.00	0.8572	0.1428	0.0006
613.55	1.91	0.00	0.8576	0.1424	0.0006
613.54	1.91	0.00	0.8581	0.1419	0.0006
613.53	1.91	0.00	0.8585	0.1415	0.0006
613.52	1.91	0.00	0.8589	0.1411	0.0006
613.51	1.90	0.00	0.8593	0.1407	0.0006
613.50	1.90	0.00	0.8597	0.1403	0.0006
613.49	1.90	0.00	0.8601	0.1399	0.0006
613.48	1.90	0.00	0.8605	0.1395	0.0006

613.47	1.90	0.00	0.8610	0.1390	0.0006
613.46	1.89	0.00	0.8614	0.1386	0.0006
613.45	1.89	0.00	0.8618	0.1382	0.0006
613.44	1.89	0.00	0.8622	0.1378	0.0006
613.43	1.89	0.00	0.8626	0.1374	0.0006
613.42	1.88	0.00	0.8630	0.1370	0.0006
613.41	1.88	0.00	0.8634	0.1366	0.0006
613.40	1.88	0.00	0.8638	0.1362	0.0006
613.39	1.88	0.00	0.8643	0.1357	0.0006
613.38	1.87	0.00	0.8647	0.1353	0.0006
613.37	1.87	0.00	0.8651	0.1349	0.0006
613.36	1.87	0.00	0.8655	0.1345	0.0006
613.35	1.87	0.00	0.8659	0.1341	0.0006
613.34	1.87	0.00	0.8663	0.1337	0.0006
613.33	1.86	0.00	0.8667	0.1333	0.0006
613.32	1.86	0.00	0.8671	0.1329	0.0006
613.31	1.86	0.00	0.8675	0.1325	0.0006
613.30	1.86	0.00	0.8679	0.1321	0.0006
613.29	1.85	0.00	0.8683	0.1317	0.0006
613.28	1.85	0.00	0.8687	0.1313	0.0006
613.27	1.85	0.00	0.8691	0.1309	0.0006
613.26	1.85	0.00	0.8695	0.1305	0.0006
613.25	1.84	0.00	0.8699	0.1301	0.0006
613.24	1.84	0.00	0.8703	0.1297	0.0006
613.23	1.84	0.00	0.8707	0.1293	0.0006
613.22	1.84	0.00	0.8711	0.1289	0.0006
613.21	1.84	0.00	0.8715	0.1285	0.0006
613.20	1.83	0.00	0.8719	0.1281	0.0006
613.19	1.83	0.00	0.8723	0.1277	0.0006
613.18	1.83	0.00	0.8727	0.1273	0.0006
613.17	1.83	0.00	0.8731	0.1269	0.0006
613.16	1.82	0.00	0.8735	0.1265	0.0006
613.15	1.82	0.00	0.8739	0.1261	0.0006
613.14	1.82	0.00	0.8743	0.1257	0.0005
613.13	1.82	0.00	0.8747	0.1253	0.0005
613.12	1.82	0.00	0.8751	0.1249	0.0005
613.11	1.81	0.00	0.8755	0.1245	0.0005
613.10	1.81	0.00	0.8759	0.1241	0.0005
613.09	1.81	0.00	0.8763	0.1237	0.0005
613.08	1.81	0.00	0.8767	0.1233	0.0005
613.07	1.80	0.00	0.8771	0.1229	0.0005
613.06	1.80	0.00	0.8775	0.1225	0.0005
613.05	1.80	0.00	0.8779	0.1221	0.0005
613.04	1.80	0.00	0.8783	0.1217	0.0005
613.03	1.79	0.00	0.8787	0.1213	0.0005
613.02	1.79	0.00	0.8791	0.1209	0.0005
613.01	1.79	0.00	0.8795	0.1205	0.0005
613.00	1.79	0.00	0.8798	0.1202	0.0005
612.99	1.79	0.00	0.8802	0.1198	0.0005
612.98	1.78	0.00	0.8806	0.1194	0.0005
612.97	1.78	0.00	0.8810	0.1190	0.0005
612.96	1.78	0.00	0.8814	0.1186	0.0005
612.95	1.78	0.00	0.8818	0.1182	0.0005
612.94	1.77	0.00	0.8822	0.1178	0.0005
612.93	1.77	0.00	0.8826	0.1174	0.0005
612.92	1.77	0.00	0.8829	0.1171	0.0005
612.91	1.77	0.00	0.8833	0.1167	0.0005
612.90	1.77	0.00	0.8837	0.1163	0.0005
612.89	1.76	0.00	0.8841	0.1159	0.0005
612.88	1.76	0.00	0.8845	0.1155	0.0005
612.87	1.76	0.00	0.8849	0.1151	0.0005
612.86	1.76	0.00	0.8852	0.1148	0.0005
612.85	1.75	0.00	0.8856	0.1144	0.0005
612.84	1.75	0.00	0.8860	0.1140	0.0005
612.83	1.75	0.00	0.8864	0.1136	0.0005
612.82	1.75	0.00	0.8868	0.1132	0.0005
612.81	1.74	0.00	0.8871	0.1129	0.0005
612.80	1.74	0.00	0.8875	0.1125	0.0005
612.79	1.74	0.00	0.8879	0.1121	0.0005
612.78	1.74	0.00	0.8883	0.1117	0.0005
612.77	1.74	0.00	0.8887	0.1113	0.0005
612.76	1.73	0.00	0.8890	0.1110	0.0005
612.75	1.73	0.00	0.8894	0.1106	0.0005
612.74	1.73	0.00	0.8898	0.1102	0.0005
612.73	1.73	0.00	0.8902	0.1098	0.0005
612.72	1.72	0.00	0.8905	0.1095	0.0005
612.71	1.72	0.00	0.8909	0.1091	0.0005
612.70	1.72	0.00	0.8913	0.1087	0.0005
612.69	1.72	0.00	0.8916	0.1084	0.0005

612.68	1.71	0.00	0.8920	0.1080	0.0005
612.67	1.71	0.00	0.8924	0.1076	0.0005
612.66	1.71	0.00	0.8928	0.1072	0.0005
612.65	1.71	0.00	0.8931	0.1069	0.0005
612.64	1.71	0.00	0.8935	0.1065	0.0005
612.63	1.70	0.00	0.8939	0.1061	0.0005
612.62	1.70	0.00	0.8942	0.1058	0.0005
612.61	1.70	0.00	0.8946	0.1054	0.0005
612.60	1.70	0.00	0.8950	0.1050	0.0005
612.59	1.69	0.00	0.8953	0.1047	0.0005
612.58	1.69	0.00	0.8957	0.1043	0.0005
612.57	1.69	0.00	0.8961	0.1039	0.0005
612.56	1.69	0.00	0.8964	0.1036	0.0005
612.55	1.69	0.00	0.8968	0.1032	0.0005
612.54	1.68	0.00	0.8972	0.1028	0.0004
612.53	1.68	0.00	0.8975	0.1025	0.0004
612.52	1.68	0.00	0.8979	0.1021	0.0004
612.51	1.68	0.00	0.8983	0.1017	0.0004
612.50	1.67	0.00	0.8986	0.1014	0.0004
612.49	1.67	0.00	0.8990	0.1010	0.0004
612.48	1.67	0.00	0.8993	0.1007	0.0004
612.47	1.67	0.00	0.8997	0.1003	0.0004
612.46	1.66	0.00	0.9001	0.0999	0.0004
612.45	1.66	0.00	0.9004	0.0996	0.0004
612.44	1.66	0.00	0.9008	0.0992	0.0004
612.43	1.66	0.00	0.9011	0.0989	0.0004
612.42	1.66	0.00	0.9015	0.0985	0.0004
612.41	1.65	0.00	0.9018	0.0982	0.0004
612.40	1.65	0.00	0.9022	0.0978	0.0004
612.39	1.65	0.00	0.9025	0.0975	0.0004
612.38	1.65	0.00	0.9029	0.0971	0.0004
612.37	1.64	0.00	0.9033	0.0967	0.0004
612.36	1.64	0.00	0.9036	0.0964	0.0004
612.35	1.64	0.00	0.9040	0.0960	0.0004
612.34	1.64	0.00	0.9043	0.0957	0.0004
612.33	1.64	0.00	0.9047	0.0953	0.0004
612.32	1.63	0.00	0.9050	0.0950	0.0004
612.31	1.63	0.00	0.9054	0.0946	0.0004
612.30	1.63	0.00	0.9057	0.0943	0.0004
612.29	1.63	0.00	0.9061	0.0939	0.0004
612.28	1.62	0.00	0.9064	0.0936	0.0004
612.27	1.62	0.00	0.9068	0.0932	0.0004
612.26	1.62	0.00	0.9071	0.0929	0.0004
612.25	1.62	0.00	0.9074	0.0926	0.0004
612.24	1.61	0.00	0.9078	0.0922	0.0004
612.23	1.61	0.00	0.9081	0.0919	0.0004
612.22	1.61	0.00	0.9085	0.0915	0.0004
612.21	1.61	0.00	0.9088	0.0912	0.0004
612.20	1.61	0.00	0.9092	0.0908	0.0004
612.19	1.60	0.00	0.9095	0.0905	0.0004
612.18	1.60	0.00	0.9098	0.0902	0.0004
612.17	1.60	0.00	0.9102	0.0898	0.0004
612.16	1.60	0.00	0.9105	0.0895	0.0004
612.15	1.59	0.00	0.9109	0.0891	0.0004
612.14	1.59	0.00	0.9112	0.0888	0.0004
612.13	1.59	0.00	0.9115	0.0885	0.0004
612.12	1.59	0.00	0.9119	0.0881	0.0004
612.11	1.59	0.00	0.9122	0.0878	0.0004
612.10	1.58	0.00	0.9126	0.0874	0.0004
612.09	1.58	0.00	0.9129	0.0871	0.0004
612.08	1.58	0.00	0.9132	0.0868	0.0004
612.07	1.58	0.00	0.9136	0.0864	0.0004
612.06	1.57	0.00	0.9139	0.0861	0.0004
612.05	1.57	0.00	0.9142	0.0858	0.0004
612.04	1.57	0.00	0.9146	0.0854	0.0004
612.03	1.57	0.00	0.9149	0.0851	0.0004
612.02	1.56	0.00	0.9152	0.0848	0.0004
612.01	1.56	0.00	0.9155	0.0845	0.0004
612.00	1.56	0.00	0.9159	0.0841	0.0004
611.99	1.56	0.00	0.9162	0.0838	0.0004
611.98	1.56	0.00	0.9165	0.0835	0.0004
611.97	1.55	0.00	0.9169	0.0831	0.0004
611.96	1.55	0.00	0.9172	0.0828	0.0004
611.95	1.55	0.00	0.9175	0.0825	0.0004
611.94	1.55	0.00	0.9178	0.0822	0.0004
611.93	1.54	0.00	0.9182	0.0818	0.0004
611.92	1.54	0.00	0.9185	0.0815	0.0004
611.91	1.54	0.00	0.9188	0.0812	0.0004
611.90	1.54	0.00	0.9191	0.0809	0.0004

611.89	1.53	0.00	0.9195	0.0805	0.0004
611.88	1.53	0.00	0.9198	0.0802	0.0004
611.87	1.53	0.00	0.9201	0.0799	0.0003
611.86	1.53	0.00	0.9204	0.0796	0.0003
611.85	1.53	0.00	0.9207	0.0793	0.0003
611.84	1.52	0.00	0.9211	0.0789	0.0003
611.83	1.52	0.00	0.9214	0.0786	0.0003
611.82	1.52	0.00	0.9217	0.0783	0.0003
611.81	1.52	0.00	0.9220	0.0780	0.0003
611.80	1.51	0.00	0.9223	0.0777	0.0003
611.79	1.51	0.00	0.9227	0.0773	0.0003
611.78	1.51	0.00	0.9230	0.0770	0.0003
611.77	1.51	0.00	0.9233	0.0767	0.0003
611.76	1.51	0.00	0.9236	0.0764	0.0003
611.75	1.50	0.00	0.9239	0.0761	0.0003
611.74	1.50	0.00	0.9242	0.0758	0.0003
611.73	1.50	0.00	0.9245	0.0755	0.0003
611.72	1.50	0.00	0.9248	0.0752	0.0003
611.71	1.49	0.00	0.9252	0.0748	0.0003
611.70	1.49	0.00	0.9255	0.0745	0.0003
611.69	1.49	0.00	0.9258	0.0742	0.0003
611.68	1.49	0.00	0.9261	0.0739	0.0003
611.67	1.48	0.00	0.9264	0.0736	0.0003
611.66	1.48	0.00	0.9267	0.0733	0.0003
611.65	1.48	0.00	0.9270	0.0730	0.0003
611.64	1.48	0.00	0.9273	0.0727	0.0003
611.63	1.48	0.00	0.9276	0.0724	0.0003
611.62	1.47	0.00	0.9279	0.0721	0.0003
611.61	1.47	0.00	0.9282	0.0718	0.0003
611.60	1.47	0.00	0.9285	0.0715	0.0003
611.59	1.47	0.00	0.9288	0.0712	0.0003
611.58	1.46	0.00	0.9291	0.0709	0.0003
611.57	1.46	0.00	0.9294	0.0706	0.0003
611.56	1.46	0.00	0.9297	0.0703	0.0003
611.55	1.46	0.00	0.9300	0.0700	0.0003
611.54	1.46	0.00	0.9303	0.0697	0.0003
611.53	1.45	0.00	0.9306	0.0694	0.0003
611.52	1.45	0.00	0.9309	0.0691	0.0003
611.51	1.45	0.00	0.9312	0.0688	0.0003
611.50	1.45	0.00	0.9315	0.0685	0.0003
611.49	1.44	0.00	0.9318	0.0682	0.0003
611.48	1.44	0.00	0.9321	0.0679	0.0003
611.47	1.44	0.00	0.9324	0.0676	0.0003
611.46	1.44	0.00	0.9327	0.0673	0.0003
611.45	1.43	0.00	0.9330	0.0670	0.0003
611.44	1.43	0.00	0.9333	0.0667	0.0003
611.43	1.43	0.00	0.9336	0.0664	0.0003
611.42	1.43	0.00	0.9339	0.0661	0.0003
611.41	1.43	0.00	0.9341	0.0659	0.0003
611.40	1.42	0.00	0.9344	0.0656	0.0003
611.39	1.42	0.00	0.9347	0.0653	0.0003
611.38	1.42	0.00	0.9350	0.0650	0.0003
611.37	1.42	0.00	0.9353	0.0647	0.0003
611.36	1.41	0.00	0.9356	0.0644	0.0003
611.35	1.41	0.00	0.9359	0.0641	0.0003
611.34	1.41	0.00	0.9362	0.0638	0.0003
611.33	1.41	0.00	0.9364	0.0636	0.0003
611.32	1.40	0.00	0.9367	0.0633	0.0003
611.31	1.40	0.00	0.9370	0.0630	0.0003
611.30	1.40	0.00	0.9373	0.0627	0.0003
611.29	1.40	0.00	0.9376	0.0624	0.0003
611.28	1.40	0.00	0.9379	0.0621	0.0003
611.27	1.39	0.00	0.9381	0.0619	0.0003
611.26	1.39	0.00	0.9384	0.0616	0.0003
611.25	1.39	0.00	0.9387	0.0613	0.0003
611.24	1.39	0.00	0.9390	0.0610	0.0003
611.23	1.38	0.00	0.9392	0.0608	0.0003
611.22	1.38	0.00	0.9395	0.0605	0.0003
611.21	1.38	0.00	0.9398	0.0602	0.0003
611.20	1.38	0.00	0.9401	0.0599	0.0003
611.19	1.38	0.00	0.9403	0.0597	0.0003
611.18	1.37	0.00	0.9406	0.0594	0.0003
611.17	1.37	0.00	0.9409	0.0591	0.0003
611.16	1.37	0.00	0.9412	0.0588	0.0003
611.15	1.37	0.00	0.9414	0.0586	0.0003
611.14	1.36	0.00	0.9417	0.0583	0.0003
611.13	1.36	0.00	0.9420	0.0580	0.0003
611.12	1.36	0.00	0.9423	0.0577	0.0003
611.11	1.36	0.00	0.9425	0.0575	0.0003

611.10	1.35	0.00	0.9428	0.0572	0.0003
611.09	1.35	0.00	0.9431	0.0569	0.0002
611.08	1.35	0.00	0.9433	0.0567	0.0002
611.07	1.35	0.00	0.9436	0.0564	0.0002
611.06	1.35	0.00	0.9439	0.0561	0.0002
611.05	1.34	0.00	0.9441	0.0559	0.0002
611.04	1.34	0.00	0.9444	0.0556	0.0002
611.03	1.34	0.00	0.9446	0.0554	0.0002
611.02	1.34	0.00	0.9449	0.0551	0.0002
611.01	1.33	0.00	0.9452	0.0548	0.0002
611.00	1.33	0.00	0.9454	0.0546	0.0002
610.99	1.33	0.00	0.9457	0.0543	0.0002
610.98	1.33	0.00	0.9460	0.0540	0.0002
610.97	1.33	0.00	0.9462	0.0538	0.0002
610.96	1.32	0.00	0.9465	0.0535	0.0002
610.95	1.32	0.00	0.9467	0.0533	0.0002
610.94	1.32	0.00	0.9470	0.0530	0.0002
610.93	1.32	0.00	0.9472	0.0528	0.0002
610.92	1.31	0.00	0.9475	0.0525	0.0002
610.91	1.31	0.00	0.9478	0.0522	0.0002
610.90	1.31	0.00	0.9480	0.0520	0.0002
610.89	1.31	0.00	0.9483	0.0517	0.0002
610.88	1.30	0.00	0.9485	0.0515	0.0002
610.87	1.30	0.00	0.9488	0.0512	0.0002
610.86	1.30	0.00	0.9490	0.0510	0.0002
610.85	1.30	0.00	0.9493	0.0507	0.0002
610.84	1.30	0.00	0.9495	0.0505	0.0002
610.83	1.29	0.00	0.9498	0.0502	0.0002
610.82	1.29	0.00	0.9500	0.0500	0.0002
610.81	1.29	0.00	0.9503	0.0497	0.0002
610.80	1.29	0.00	0.9505	0.0495	0.0002
610.79	1.28	0.00	0.9508	0.0492	0.0002
610.78	1.28	0.00	0.9510	0.0490	0.0002
610.77	1.28	0.00	0.9512	0.0488	0.0002
610.76	1.28	0.00	0.9515	0.0485	0.0002
610.75	1.27	0.00	0.9517	0.0483	0.0002
610.74	1.27	0.00	0.9520	0.0480	0.0002
610.73	1.27	0.00	0.9522	0.0478	0.0002
610.72	1.27	0.00	0.9525	0.0475	0.0002
610.71	1.27	0.00	0.9527	0.0473	0.0002
610.70	1.26	0.00	0.9529	0.0471	0.0002
610.69	1.26	0.00	0.9532	0.0468	0.0002
610.68	1.26	0.00	0.9534	0.0466	0.0002
610.67	1.26	0.00	0.9537	0.0463	0.0002
610.66	1.25	0.00	0.9539	0.0461	0.0002
610.65	1.25	0.00	0.9541	0.0459	0.0002
610.64	1.25	0.00	0.9544	0.0456	0.0002
610.63	1.25	0.00	0.9546	0.0454	0.0002
610.62	1.25	0.00	0.9548	0.0452	0.0002
610.61	1.24	0.00	0.9551	0.0449	0.0002
610.60	1.24	0.00	0.9553	0.0447	0.0002
610.59	1.24	0.00	0.9555	0.0445	0.0002
610.58	1.24	0.00	0.9558	0.0442	0.0002
610.57	1.23	0.00	0.9560	0.0440	0.0002
610.56	1.23	0.00	0.9562	0.0438	0.0002
610.55	1.23	0.00	0.9565	0.0435	0.0002
610.54	1.23	0.00	0.9567	0.0433	0.0002
610.53	1.22	0.00	0.9569	0.0431	0.0002
610.52	1.22	0.00	0.9571	0.0429	0.0002
610.51	1.22	0.00	0.9574	0.0426	0.0002
610.50	1.22	0.00	0.9576	0.0424	0.0002
610.49	1.22	0.00	0.9578	0.0422	0.0002
610.48	1.21	0.00	0.9580	0.0420	0.0002
610.47	1.21	0.00	0.9583	0.0417	0.0002
610.46	1.21	0.00	0.9585	0.0415	0.0002
610.45	1.21	0.00	0.9587	0.0413	0.0002
610.44	1.20	0.00	0.9589	0.0411	0.0002
610.43	1.20	0.00	0.9591	0.0409	0.0002
610.42	1.20	0.00	0.9594	0.0406	0.0002
610.41	1.20	0.00	0.9596	0.0404	0.0002
610.40	1.20	0.00	0.9598	0.0402	0.0002
610.39	1.19	0.00	0.9600	0.0400	0.0002
610.38	1.19	0.00	0.9602	0.0398	0.0002
610.37	1.19	0.00	0.9605	0.0395	0.0002
610.36	1.19	0.00	0.9607	0.0393	0.0002
610.35	1.18	0.00	0.9609	0.0391	0.0002
610.34	1.18	0.00	0.9611	0.0389	0.0002
610.33	1.18	0.00	0.9613	0.0387	0.0002
610.32	1.18	0.00	0.9615	0.0385	0.0002

610.31	1.17	0.00	0.9617	0.0383	0.0002
610.30	1.17	0.00	0.9620	0.0380	0.0002
610.29	1.17	0.00	0.9622	0.0378	0.0002
610.28	1.17	0.00	0.9624	0.0376	0.0002
610.27	1.17	0.00	0.9626	0.0374	0.0002
610.26	1.16	0.00	0.9628	0.0372	0.0002
610.25	1.16	0.00	0.9630	0.0370	0.0002
610.24	1.16	0.00	0.9632	0.0368	0.0002
610.23	1.16	0.00	0.9634	0.0366	0.0002
610.22	1.15	0.00	0.9636	0.0364	0.0002
610.21	1.15	0.00	0.9638	0.0362	0.0002
610.20	1.15	0.00	0.9640	0.0360	0.0002
610.19	1.15	0.00	0.9642	0.0358	0.0002
610.18	1.14	0.00	0.9644	0.0356	0.0002
610.17	1.14	0.00	0.9646	0.0354	0.0002
610.16	1.14	0.00	0.9648	0.0352	0.0002
610.15	1.14	0.00	0.9650	0.0350	0.0002
610.14	1.14	0.00	0.9652	0.0348	0.0002
610.13	1.13	0.00	0.9654	0.0346	0.0002
610.12	1.13	0.00	0.9656	0.0344	0.0002
610.11	1.13	0.00	0.9658	0.0342	0.0001
610.10	1.13	0.00	0.9660	0.0340	0.0001
610.09	1.12	0.00	0.9662	0.0338	0.0001
610.08	1.12	0.00	0.9664	0.0336	0.0001
610.07	1.12	0.00	0.9666	0.0334	0.0001
610.06	1.12	0.00	0.9668	0.0332	0.0001
610.05	1.12	0.00	0.9670	0.0330	0.0001
610.04	1.11	0.00	0.9672	0.0328	0.0001
610.03	1.11	0.00	0.9674	0.0326	0.0001
610.02	1.11	0.00	0.9676	0.0324	0.0001
610.01	1.11	0.00	0.9678	0.0322	0.0001
610.00	1.10	0.00	0.9680	0.0320	0.0001
609.99	1.10	0.00	0.9682	0.0318	0.0001
609.98	1.10	0.00	0.9684	0.0316	0.0001
609.97	1.10	0.00	0.9685	0.0315	0.0001
609.96	1.09	0.00	0.9687	0.0313	0.0001
609.95	1.09	0.00	0.9689	0.0311	0.0001
609.94	1.09	0.00	0.9691	0.0309	0.0001
609.93	1.09	0.00	0.9693	0.0307	0.0001
609.92	1.09	0.00	0.9695	0.0305	0.0001
609.91	1.08	0.00	0.9697	0.0303	0.0001
609.90	1.08	0.00	0.9699	0.0301	0.0001
609.89	1.08	0.00	0.9700	0.0300	0.0001
609.88	1.08	0.00	0.9702	0.0298	0.0001
609.87	1.07	0.00	0.9704	0.0296	0.0001
609.86	1.07	0.00	0.9706	0.0294	0.0001
609.85	1.07	0.00	0.9708	0.0292	0.0001
609.84	1.07	0.00	0.9709	0.0291	0.0001
609.83	1.07	0.00	0.9711	0.0289	0.0001
609.82	1.06	0.00	0.9713	0.0287	0.0001
609.81	1.06	0.00	0.9715	0.0285	0.0001
609.80	1.06	0.00	0.9717	0.0283	0.0001
609.79	1.06	0.00	0.9718	0.0282	0.0001
609.78	1.05	0.00	0.9720	0.0280	0.0001
609.77	1.05	0.00	0.9722	0.0278	0.0001
609.76	1.05	0.00	0.9724	0.0276	0.0001
609.75	1.05	0.00	0.9725	0.0275	0.0001
609.74	1.04	0.00	0.9727	0.0273	0.0001
609.73	1.04	0.00	0.9729	0.0271	0.0001
609.72	1.04	0.00	0.9730	0.0270	0.0001
609.71	1.04	0.00	0.9732	0.0268	0.0001
609.70	1.04	0.00	0.9734	0.0266	0.0001
609.69	1.03	0.00	0.9736	0.0264	0.0001
609.68	1.03	0.00	0.9737	0.0263	0.0001
609.67	1.03	0.00	0.9739	0.0261	0.0001
609.66	1.03	0.00	0.9741	0.0259	0.0001
609.65	1.02	0.00	0.9742	0.0258	0.0001
609.64	1.02	0.00	0.9744	0.0256	0.0001
609.63	1.02	0.00	0.9746	0.0254	0.0001
609.62	1.02	0.00	0.9747	0.0253	0.0001
609.61	1.02	0.00	0.9749	0.0251	0.0001
609.60	1.01	0.00	0.9751	0.0249	0.0001
609.59	1.01	0.00	0.9752	0.0248	0.0001
609.58	1.01	0.00	0.9754	0.0246	0.0001
609.57	1.01	0.00	0.9755	0.0245	0.0001
609.56	1.00	0.00	0.9757	0.0243	0.0001
609.55	1.00	0.00	0.9759	0.0241	0.0001
609.54	1.00	0.00	0.9760	0.0240	0.0001
609.53	1.00	0.00	0.9762	0.0238	0.0001

609.52	0.99	0.00	0.9763	0.0237	0.0001
609.51	0.99	0.00	0.9765	0.0235	0.0001
609.50	0.99	0.00	0.9767	0.0233	0.0001
609.49	0.99	0.00	0.9768	0.0232	0.0001
609.48	0.99	0.00	0.9770	0.0230	0.0001
609.47	0.98	0.00	0.9771	0.0229	0.0001
609.46	0.98	0.00	0.9773	0.0227	0.0001
609.45	0.98	0.00	0.9774	0.0226	0.0001
609.44	0.98	0.00	0.9776	0.0224	0.0001
609.43	0.97	0.00	0.9777	0.0223	0.0001
609.42	0.97	0.00	0.9779	0.0221	0.0001
609.41	0.97	0.00	0.9780	0.0220	0.0001
609.40	0.97	0.00	0.9782	0.0218	0.0001
609.39	0.96	0.00	0.9783	0.0217	0.0001
609.38	0.96	0.00	0.9785	0.0215	0.0001
609.37	0.96	0.00	0.9786	0.0214	0.0001
609.36	0.96	0.00	0.9788	0.0212	0.0001
609.35	0.96	0.00	0.9789	0.0211	0.0001
609.34	0.95	0.00	0.9791	0.0209	0.0001
609.33	0.95	0.00	0.9792	0.0208	0.0001
609.32	0.95	0.00	0.9794	0.0206	0.0001
609.31	0.95	0.00	0.9795	0.0205	0.0001
609.30	0.94	0.00	0.9797	0.0203	0.0001
609.29	0.94	0.00	0.9798	0.0202	0.0001
609.28	0.94	0.00	0.9799	0.0201	0.0001
609.27	0.94	0.00	0.9801	0.0199	0.0001
609.26	0.94	0.00	0.9802	0.0198	0.0001
609.25	0.93	0.00	0.9804	0.0196	0.0001
609.24	0.93	0.00	0.9805	0.0195	0.0001
609.23	0.93	0.00	0.9806	0.0194	0.0001
609.22	0.93	0.00	0.9808	0.0192	0.0001
609.21	0.92	0.00	0.9809	0.0191	0.0001
609.20	0.92	0.00	0.9811	0.0189	0.0001
609.19	0.92	0.00	0.9812	0.0188	0.0001
609.18	0.92	0.00	0.9813	0.0187	0.0001
609.17	0.91	0.00	0.9815	0.0185	0.0001
609.16	0.91	0.00	0.9816	0.0184	0.0001
609.15	0.91	0.00	0.9817	0.0183	0.0001
609.14	0.91	0.00	0.9819	0.0181	0.0001
609.13	0.91	0.00	0.9820	0.0180	0.0001
609.12	0.90	0.00	0.9821	0.0179	0.0001
609.11	0.90	0.00	0.9823	0.0177	0.0001
609.10	0.90	0.00	0.9824	0.0176	0.0001
609.09	0.90	0.00	0.9825	0.0175	0.0001
609.08	0.89	0.00	0.9827	0.0173	0.0001
609.07	0.89	0.00	0.9828	0.0172	0.0001
609.06	0.89	0.00	0.9829	0.0171	0.0001
609.05	0.89	0.00	0.9830	0.0170	0.0001
609.04	0.89	0.00	0.9832	0.0168	0.0001
609.03	0.88	0.00	0.9833	0.0167	0.0001
609.02	0.88	0.00	0.9834	0.0166	0.0001
609.01	0.88	0.00	0.9836	0.0164	0.0001
609.00	0.88	0.00	0.9837	0.0163	0.0001
608.99	0.87	0.00	0.9838	0.0162	0.0001
608.98	0.87	0.00	0.9839	0.0161	0.0001
608.97	0.87	0.00	0.9841	0.0159	0.0001
608.96	0.87	0.00	0.9842	0.0158	0.0001
608.95	0.86	0.00	0.9843	0.0157	0.0001
608.94	0.86	0.00	0.9844	0.0156	0.0001
608.93	0.86	0.00	0.9845	0.0155	0.0001
608.92	0.86	0.00	0.9847	0.0153	0.0001
608.91	0.86	0.00	0.9848	0.0152	0.0001
608.90	0.85	0.00	0.9849	0.0151	0.0001
608.89	0.85	0.00	0.9850	0.0150	0.0001
608.88	0.85	0.00	0.9851	0.0149	0.0001
608.87	0.85	0.00	0.9853	0.0147	0.0001
608.86	0.84	0.00	0.9854	0.0146	0.0001
608.85	0.84	0.00	0.9855	0.0145	0.0001
608.84	0.84	0.00	0.9856	0.0144	0.0001
608.83	0.84	0.00	0.9857	0.0143	0.0001
608.82	0.83	0.00	0.9858	0.0142	0.0001
608.81	0.83	0.00	0.9859	0.0141	0.0001
608.80	0.83	0.00	0.9861	0.0139	0.0001
608.79	0.83	0.00	0.9862	0.0138	0.0001
608.78	0.83	0.00	0.9863	0.0137	0.0001
608.77	0.82	0.00	0.9864	0.0136	0.0001
608.76	0.82	0.00	0.9865	0.0135	0.0001
608.75	0.82	0.00	0.9866	0.0134	0.0001
608.74	0.82	0.00	0.9867	0.0133	0.0001

608.73	0.81	0.00	0.9868	0.0132	0.0001
608.72	0.81	0.00	0.9869	0.0131	0.0001
608.71	0.81	0.00	0.9871	0.0129	0.0001
608.70	0.81	0.00	0.9872	0.0128	0.0001
608.69	0.81	0.00	0.9873	0.0127	0.0001
608.68	0.80	0.00	0.9874	0.0126	0.0001
608.67	0.80	0.00	0.9875	0.0125	0.0001
608.66	0.80	0.00	0.9876	0.0124	0.0001
608.65	0.80	0.00	0.9877	0.0123	0.0001
608.64	0.79	0.00	0.9878	0.0122	0.0001
608.63	0.79	0.00	0.9879	0.0121	0.0001
608.62	0.79	0.00	0.9880	0.0120	0.0001
608.61	0.79	0.00	0.9881	0.0119	0.0001
608.60	0.78	0.00	0.9882	0.0118	0.0001
608.59	0.78	0.00	0.9883	0.0117	0.0001
608.58	0.78	0.00	0.9884	0.0116	0.0001
608.57	0.78	0.00	0.9885	0.0115	0.0001
608.56	0.78	0.00	0.9886	0.0114	0.0000
608.55	0.77	0.00	0.9887	0.0113	0.0000
608.54	0.77	0.00	0.9888	0.0112	0.0000
608.53	0.77	0.00	0.9889	0.0111	0.0000
608.52	0.77	0.00	0.9890	0.0110	0.0000
608.51	0.76	0.00	0.9891	0.0109	0.0000
608.50	0.76	0.00	0.9892	0.0108	0.0000
608.49	0.76	0.00	0.9893	0.0107	0.0000
608.48	0.76	0.00	0.9894	0.0106	0.0000
608.47	0.76	0.00	0.9895	0.0105	0.0000
608.46	0.75	0.00	0.9896	0.0104	0.0000
608.45	0.75	0.00	0.9897	0.0103	0.0000
608.44	0.75	0.00	0.9898	0.0102	0.0000
608.43	0.75	0.00	0.9898	0.0102	0.0000
608.42	0.74	0.00	0.9899	0.0101	0.0000
608.41	0.74	0.00	0.9900	0.0100	0.0000
608.40	0.74	0.00	0.9901	0.0099	0.0000
608.39	0.74	0.00	0.9902	0.0098	0.0000
608.38	0.73	0.00	0.9903	0.0097	0.0000
608.37	0.73	0.00	0.9904	0.0096	0.0000
608.36	0.73	0.00	0.9905	0.0095	0.0000
608.35	0.73	0.00	0.9906	0.0094	0.0000
608.34	0.73	0.00	0.9907	0.0093	0.0000
608.33	0.72	0.00	0.9907	0.0093	0.0000
608.32	0.72	0.00	0.9908	0.0092	0.0000
608.31	0.72	0.00	0.9909	0.0091	0.0000
608.30	0.72	0.00	0.9910	0.0090	0.0000
608.29	0.71	0.00	0.9911	0.0089	0.0000
608.28	0.71	0.00	0.9912	0.0088	0.0000
608.27	0.71	0.00	0.9912	0.0088	0.0000
608.26	0.71	0.00	0.9913	0.0087	0.0000
608.25	0.70	0.00	0.9914	0.0086	0.0000
608.24	0.70	0.00	0.9915	0.0085	0.0000
608.23	0.70	0.00	0.9916	0.0084	0.0000
608.22	0.70	0.00	0.9917	0.0083	0.0000
608.21	0.70	0.00	0.9917	0.0083	0.0000
608.20	0.69	0.00	0.9918	0.0082	0.0000
608.19	0.69	0.00	0.9919	0.0081	0.0000
608.18	0.69	0.00	0.9920	0.0080	0.0000
608.17	0.69	0.00	0.9921	0.0079	0.0000
608.16	0.68	0.00	0.9921	0.0079	0.0000
608.15	0.68	0.00	0.9922	0.0078	0.0000
608.14	0.68	0.00	0.9923	0.0077	0.0000
608.13	0.68	0.00	0.9924	0.0076	0.0000
608.12	0.68	0.00	0.9924	0.0076	0.0000
608.11	0.67	0.00	0.9925	0.0075	0.0000
608.10	0.67	0.00	0.9926	0.0074	0.0000
608.09	0.67	0.00	0.9927	0.0073	0.0000
608.08	0.67	0.00	0.9927	0.0073	0.0000
608.07	0.66	0.00	0.9928	0.0072	0.0000
608.06	0.66	0.00	0.9929	0.0071	0.0000
608.05	0.66	0.00	0.9930	0.0070	0.0000
608.04	0.66	0.00	0.9930	0.0070	0.0000
608.03	0.65	0.00	0.9931	0.0069	0.0000
608.02	0.65	0.00	0.9932	0.0068	0.0000
608.01	0.65	0.00	0.9933	0.0067	0.0000
608.00	0.65	0.00	0.9933	0.0067	0.0000
607.99	0.65	0.00	0.9934	0.0066	0.0000
607.98	0.64	0.00	0.9935	0.0065	0.0000
607.97	0.64	0.00	0.9935	0.0065	0.0000
607.96	0.64	0.00	0.9936	0.0064	0.0000
607.95	0.64	0.00	0.9937	0.0063	0.0000



607.94	0.63	0.00	0.9937	0.0063	0.0000
607.93	0.63	0.00	0.9938	0.0062	0.0000
607.92	0.63	0.00	0.9939	0.0061	0.0000
607.91	0.63	0.00	0.9939	0.0061	0.0000
607.90	0.63	0.00	0.9940	0.0060	0.0000
607.89	0.62	0.00	0.9941	0.0059	0.0000
607.88	0.62	0.00	0.9941	0.0059	0.0000
607.87	0.62	0.00	0.9942	0.0058	0.0000
607.86	0.62	0.00	0.9943	0.0057	0.0000
607.85	0.61	0.00	0.9943	0.0057	0.0000
607.84	0.61	0.00	0.9944	0.0056	0.0000
607.83	0.61	0.00	0.9944	0.0056	0.0000
607.82	0.61	0.00	0.9945	0.0055	0.0000
607.81	0.60	0.00	0.9946	0.0054	0.0000
607.80	0.60	0.00	0.9946	0.0054	0.0000
607.79	0.60	0.00	0.9947	0.0053	0.0000
607.78	0.60	0.00	0.9947	0.0053	0.0000
607.77	0.60	0.00	0.9948	0.0052	0.0000
607.76	0.59	0.00	0.9949	0.0051	0.0000
607.75	0.59	0.00	0.9949	0.0051	0.0000
607.74	0.59	0.00	0.9950	0.0050	0.0000
607.73	0.59	0.00	0.9950	0.0050	0.0000
607.72	0.58	0.00	0.9951	0.0049	0.0000
607.71	0.58	0.00	0.9952	0.0048	0.0000
607.70	0.58	0.00	0.9952	0.0048	0.0000
607.69	0.58	0.00	0.9953	0.0047	0.0000
607.68	0.57	0.00	0.9953	0.0047	0.0000
607.67	0.57	0.00	0.9954	0.0046	0.0000
607.66	0.57	0.00	0.9954	0.0046	0.0000
607.65	0.57	0.00	0.9955	0.0045	0.0000
607.64	0.57	0.00	0.9955	0.0045	0.0000
607.63	0.56	0.00	0.9956	0.0044	0.0000
607.62	0.56	0.00	0.9956	0.0044	0.0000
607.61	0.56	0.00	0.9957	0.0043	0.0000
607.60	0.56	0.00	0.9958	0.0042	0.0000
607.59	0.55	0.00	0.9958	0.0042	0.0000
607.58	0.55	0.00	0.9959	0.0041	0.0000
607.57	0.55	0.00	0.9959	0.0041	0.0000
607.56	0.55	0.00	0.9960	0.0040	0.0000
607.55	0.55	0.00	0.9960	0.0040	0.0000
607.54	0.54	0.00	0.9961	0.0039	0.0000
607.53	0.54	0.00	0.9961	0.0039	0.0000
607.52	0.54	0.00	0.9962	0.0038	0.0000
607.51	0.54	0.00	0.9962	0.0038	0.0000
607.50	0.53	0.00	0.9963	0.0037	0.0000
607.49	0.53	0.00	0.9963	0.0037	0.0000
607.48	0.53	0.00	0.9963	0.0037	0.0000
607.47	0.53	0.00	0.9964	0.0036	0.0000
607.46	0.52	0.00	0.9964	0.0036	0.0000
607.45	0.52	0.00	0.9965	0.0035	0.0000
607.44	0.52	0.00	0.9965	0.0035	0.0000
607.43	0.52	0.00	0.9966	0.0034	0.0000
607.42	0.52	0.00	0.9966	0.0034	0.0000
607.41	0.51	0.00	0.9967	0.0033	0.0000
607.40	0.51	0.00	0.9967	0.0033	0.0000
607.39	0.51	0.00	0.9968	0.0032	0.0000
607.38	0.51	0.00	0.9968	0.0032	0.0000
607.37	0.50	0.00	0.9968	0.0032	0.0000
607.36	0.50	0.00	0.9969	0.0031	0.0000
607.35	0.50	0.00	0.9969	0.0031	0.0000
607.34	0.50	0.00	0.9970	0.0030	0.0000
607.33	0.50	0.00	0.9970	0.0030	0.0000
607.32	0.49	0.00	0.9970	0.0030	0.0000
607.31	0.49	0.00	0.9971	0.0029	0.0000
607.30	0.49	0.00	0.9971	0.0029	0.0000
607.29	0.49	0.00	0.9972	0.0028	0.0000
607.28	0.48	0.00	0.9972	0.0028	0.0000
607.27	0.48	0.00	0.9972	0.0028	0.0000
607.26	0.48	0.00	0.9973	0.0027	0.0000
607.25	0.48	0.00	0.9973	0.0027	0.0000
607.24	0.47	0.00	0.9974	0.0026	0.0000
607.23	0.47	0.00	0.9974	0.0026	0.0000
607.22	0.47	0.00	0.9974	0.0026	0.0000
607.21	0.47	0.00	0.9975	0.0025	0.0000
607.20	0.47	0.00	0.9975	0.0025	0.0000
607.19	0.46	0.00	0.9975	0.0025	0.0000
607.18	0.46	0.00	0.9976	0.0024	0.0000
607.17	0.46	0.00	0.9976	0.0024	0.0000
607.16	0.46	0.00	0.9977	0.0023	0.0000





605.57	0.09	0.00	1.0000	0.0000	0.0000
605.56	0.09	0.00	1.0000	0.0000	0.0000
605.55	0.09	0.00	1.0000	0.0000	0.0000
605.54	0.09	0.00	1.0000	0.0000	0.0000
605.53	0.08	0.00	1.0000	0.0000	0.0000
605.52	0.08	0.00	1.0000	0.0000	0.0000
605.51	0.08	0.00	1.0000	0.0000	0.0000
605.50	0.08	0.00	1.0000	0.0000	0.0000
605.49	0.08	0.00	1.0000	0.0000	0.0000
605.48	0.07	0.00	1.0000	0.0000	0.0000
605.47	0.07	0.00	1.0000	0.0000	0.0000
605.46	0.07	0.00	1.0000	0.0000	0.0000
605.45	0.07	0.00	1.0000	0.0000	0.0000
605.44	0.06	0.00	1.0000	0.0000	0.0000
605.43	0.06	0.00	1.0000	0.0000	0.0000
605.42	0.06	0.00	1.0000	0.0000	0.0000
605.41	0.06	0.00	1.0000	0.0000	0.0000
605.40	0.06	0.00	1.0000	0.0000	0.0000
605.39	0.05	0.00	1.0000	0.0000	0.0000
605.38	0.05	0.00	1.0000	0.0000	0.0000
605.37	0.05	0.00	1.0000	0.0000	0.0000
605.36	0.05	0.00	1.0000	0.0000	0.0000
605.35	0.04	0.00	1.0000	0.0000	0.0000
605.34	0.04	0.00	1.0000	0.0000	0.0000
605.33	0.04	0.00	1.0000	0.0000	0.0000
605.32	0.04	0.00	1.0000	0.0000	0.0000
605.31	0.03	0.00	1.0000	0.0000	0.0000
605.30	0.03	0.00	1.0000	0.0000	0.0000
605.29	0.03	0.00	1.0000	0.0000	0.0000
605.28	0.03	0.00	1.0000	0.0000	0.0000
605.27	0.03	0.00	1.0000	0.0000	0.0000
605.26	0.02	0.00	1.0000	0.0000	0.0000
605.25	0.02	0.00	1.0000	0.0000	0.0000
605.24	0.02	0.00	1.0000	0.0000	0.0000
605.23	0.02	0.00	1.0000	0.0000	0.0000
605.22	0.01	0.00	1.0000	0.0000	0.0000
605.21	0.01	0.00	1.0000	0.0000	0.0000
605.20	0.01	0.00	1.0000	0.0000	0.0000
605.19	0.01	0.00	1.0000	0.0000	0.0000
605.18	0.00	0.00	1.0000	0.0000	0.0000
605.17	0.00	0.00	1.0000	0.0000	0.0000
605.16	0.00	0.00	1.0000	0.0000	0.0000
Zow =	605.16	0.00	0.00	1.0000	0.0000

Oil Specific Volume      0.6524    ft<sup>3</sup>/ft<sup>2</sup>

Data Entry Worksheet for Soil Samples -- Oil Specific Volume (OSV) Calculations

Project No. = 406   = User must enter the soil or fluid parameter, or lab data, as appropriate  
 Boring Designation = RW-2

Soil Parameters

Fluid Parameters

Oil Parameters

Required to Estimate OSV - Soil

Required to Estimate OSV - Soil

$\rho_b = 1.6 \text{ g/cm}^3$  Bulk density of soil

$\rho_o = 0.7903 \text{ g/cm}^3$  Oil density

Soil Sample Data

Sample Intervals (maximum 21 samples)

	Feet (bgs)	to	Feet (bgs)	GRO or DRO (mg/kg)
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				

Deepest sample must be entered in this row

## Data Entry Worksheet for Monitoring Well Fluid Data -- Oil Specific Volume (OSV) Calculations

Project No. = 406  
Boring Designation = RW-2

= User must enter the soil or fluid parameter, or lab data, as appropriate

### Soil Parameters

#### Required to Estimate OSV - MWs

$\phi$  = 0.437 Total porosity

$\sigma_{ow}$  = 18.2 dynes/cm Oil/Water Interfacial Tension

$\sigma_{ao}$  = 22.7 dynes/cm Air/Oil Surface Tension

$\sigma_{aw}$  = 62.1 dynes/cm Air/Water Surface Tension

$\alpha$  = 0.125 /foot Van Genuchten mean pore-size parameter

$n$  = 3.00500 Van Genuchten pore-size distribution exponent

$S_m$  = 0.046 Irreducible water saturation

### Fluid Parameters

$\rho_{ro}$  = 0.7903 Ratio of oil to water density

$\beta_{ao}$  = 2.74 Ratio of water surface tension to oil surface tension

$\beta_{ow}$  = 3.41 Ratio of water surface tension to oil-water interfacial tension

$Z_{ow}$  = 18.44 feet Depth to oil/air interface

$Z_{ao}$  = 19.25 feet Depth to oil/water interface

$S_m$  = 0.046 Water saturation at field capacity

$\alpha$  = 0.125 /foot Van Genuchten mean pore-size parameter

$n$  = 3.00500 Van Genuchten pore-size distribution exponent

$m$  = 0.667221 Calculated from "n"

$dZ$  = 0.01 feet Integration increment (0.01 to 1.0)

TOC = 635.38 feet Elevation of TOC or measuring point



Oil Specific Volume Calculation Spreadsheet for Free-phase Hydrocarbon in Monitoring Wells

Project No. 406  
Boring Designation RW-2

**DO NOT CHANGE ANY CELLS ON THIS WORKSHEET**

Z (feet)	h <sub>ow</sub> (feet)	h <sub>ao</sub> (feet)	S <sub>w</sub> (-)	S <sub>of</sub> (-)	φ S <sub>of</sub> dZ (ft <sup>3</sup> /ft <sup>2</sup> )
Z <sub>u</sub> = 617.34	0.25	0.32	0.9992	0.0000	0.0000
617.33	0.25	0.31	0.9992	0.0000	0.0000
617.32	0.25	0.30	0.9992	0.0001	0.0000
617.31	0.25	0.29	0.9993	0.0001	0.0000
617.30	0.25	0.29	0.9993	0.0001	0.0000
617.29	0.24	0.28	0.9993	0.0002	0.0000
617.28	0.24	0.27	0.9993	0.0002	0.0000
617.27	0.24	0.26	0.9993	0.0002	0.0000
617.26	0.24	0.25	0.9993	0.0002	0.0000
617.25	0.24	0.25	0.9994	0.0003	0.0000
617.24	0.23	0.24	0.9994	0.0003	0.0000
617.23	0.23	0.23	0.9994	0.0003	0.0000
617.22	0.23	0.22	0.9994	0.0003	0.0000
617.21	0.23	0.21	0.9994	0.0003	0.0000
617.20	0.22	0.21	0.9994	0.0003	0.0000
617.19	0.22	0.20	0.9995	0.0003	0.0000
617.18	0.22	0.19	0.9995	0.0003	0.0000
617.17	0.22	0.18	0.9995	0.0004	0.0000
617.16	0.22	0.17	0.9995	0.0004	0.0000
617.15	0.21	0.17	0.9995	0.0004	0.0000
617.14	0.21	0.16	0.9995	0.0004	0.0000
617.13	0.21	0.15	0.9995	0.0004	0.0000
617.12	0.21	0.14	0.9996	0.0004	0.0000
617.11	0.21	0.13	0.9996	0.0004	0.0000
617.10	0.20	0.13	0.9996	0.0004	0.0000
617.09	0.20	0.12	0.9996	0.0004	0.0000
617.08	0.20	0.11	0.9996	0.0004	0.0000
617.07	0.20	0.10	0.9996	0.0003	0.0000
617.06	0.20	0.10	0.9996	0.0003	0.0000
617.05	0.19	0.09	0.9996	0.0003	0.0000
617.04	0.19	0.08	0.9997	0.0003	0.0000
617.03	0.19	0.07	0.9997	0.0003	0.0000
617.02	0.19	0.06	0.9997	0.0003	0.0000
617.01	0.18	0.06	0.9997	0.0003	0.0000
617.00	0.18	0.05	0.9997	0.0003	0.0000
616.99	0.18	0.04	0.9997	0.0003	0.0000
616.98	0.18	0.03	0.9997	0.0003	0.0000
616.97	0.18	0.02	0.9997	0.0003	0.0000
616.96	0.17	0.02	0.9997	0.0003	0.0000
616.95	0.17	0.01	0.9998	0.0002	0.0000
616.94	0.17	0.00	0.9998	0.0002	0.0000
616.93	0.17	0.00	0.9998	0.0002	0.0000
616.92	0.17	0.00	0.9998	0.0002	0.0000
616.91	0.16	0.00	0.9998	0.0002	0.0000
616.90	0.16	0.00	0.9998	0.0002	0.0000
616.89	0.16	0.00	0.9998	0.0002	0.0000
616.88	0.16	0.00	0.9998	0.0002	0.0000
616.87	0.16	0.00	0.9998	0.0002	0.0000
616.86	0.15	0.00	0.9998	0.0002	0.0000
616.85	0.15	0.00	0.9998	0.0002	0.0000
616.84	0.15	0.00	0.9998	0.0002	0.0000
616.83	0.15	0.00	0.9998	0.0002	0.0000
616.82	0.14	0.00	0.9999	0.0001	0.0000
616.81	0.14	0.00	0.9999	0.0001	0.0000
616.80	0.14	0.00	0.9999	0.0001	0.0000
616.79	0.14	0.00	0.9999	0.0001	0.0000
616.78	0.14	0.00	0.9999	0.0001	0.0000
616.77	0.13	0.00	0.9999	0.0001	0.0000
616.76	0.13	0.00	0.9999	0.0001	0.0000
616.75	0.13	0.00	0.9999	0.0001	0.0000
616.74	0.13	0.00	0.9999	0.0001	0.0000
616.73	0.13	0.00	0.9999	0.0001	0.0000
616.72	0.12	0.00	0.9999	0.0001	0.0000
616.71	0.12	0.00	0.9999	0.0001	0.0000
616.70	0.12	0.00	0.9999	0.0001	0.0000
616.69	0.12	0.00	0.9999	0.0001	0.0000
616.68	0.12	0.00	0.9999	0.0001	0.0000
616.67	0.11	0.00	0.9999	0.0001	0.0000

$$Z_u = \rho_{ro} \beta_{ao} H_o / [\rho_{ro} \beta_{ao} - (1 - \rho_{ro}) \beta_{ow}]$$

$$= 617.34 \text{ feet}$$

where:

$$\rho_{ro} = 0.7903$$

$$\beta_{ao} = 2.74$$

$$\beta_{ow} = 3.41$$

$$H_o = 0.81 \text{ feet}$$

$$Z_{ow} = 616.13 \text{ feet}$$

$$Z_{ao} = 616.94 \text{ feet}$$

Other parameters used in calculations (from Data Entry - MWs)

$$S_m = 0.046$$

$$\alpha = 0.125 \text{ /foot}$$

$$n = 3.005$$

$$m = 0.667221298$$

$$dZ = 0.01 \text{ feet} \quad \text{Integration increment (0.01 to 1.0)}$$

$$\phi = 0.437$$

Oil Specific Volume

$$\Sigma \phi S_{of} dZ = 7.0578E-05 \text{ ft}^3/\text{ft}^2 \quad \text{Oil Specific Volume}$$











Data Entry Worksheet for Soil Samples -- Oil Specific Volume (OSV) Calculations

Project No. = 406   = User must enter the soil or fluid parameter, or lab data, as appropriate  
Boring Designation = RW-4

Soil Parameters

Fluid Parameters

Oil Parameters

Required to Estimate OSV - Soil

Required to Estimate OSV - Soil

$\rho_b = 1.5 \text{ g/cm}^3$  Bulk density of soil

$\rho_o = 0.772 \text{ g/cm}^3$  Oil density

Soil Sample Data

Sample Intervals (maximum 21 samples)

	Feet (bgs)	to	Feet (bgs)	GRO or DRO (mg/kg)
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				

Deepest sample must be entered in this row

## Data Entry Worksheet for Monitoring Well Fluid Data -- Oil Specific Volume (OSV) Calculations

Project No. = 406  
Boring Designation = RW-4

= User must enter the soil or fluid parameter, or lab data, as appropriate

### Soil Parameters

#### Required to Estimate OSV - MWs

$\phi$  = 0.437 Total porosity  
 $\sigma_{ow}$  = 24.1 dynes/cm Oil/Water Interfacial Tension  
 $\sigma_{ao}$  = 22.6 dynes/cm Air/Oil Surface Tension  
 $\sigma_{aw}$  = 65.5 dynes/cm Air/Water Surface Tension  
 $\alpha$  = 0.125 /foot Van Genuchten mean pore-size parameter  
 $n$  = 3.00500 Van Genuchten pore-size distribution exponent  
 $S_m$  = 0.046 Irreducible water saturation

### Fluid Parameters

$\rho_{ro}$  = 0.772 Ratio of oil to water density  
 $\beta_{ao}$  = 2.90 Ratio of water surface tension to oil surface tension  
 $\beta_{ow}$  = 2.72 Ratio of water surface tension to oil-water interfacial tension  
 $Z_{ow}$  = 20.15 feet Depth to oil/air interface  
 $Z_{ao}$  = 25.25 feet Depth to oil/water interface  
 $S_m$  = 0.046 Water saturation at field capacity  
 $\alpha$  = 0.125 /foot Van Genuchten mean pore-size parameter  
 $n$  = 3.00500 Van Genuchten pore-size distribution exponent  
 $m$  = 0.667221 Calculated from "n"  
 $dZ$  = 0.01 feet Integration increment (0.01 to 1.0)  
TOC = 636.24 feet Elevation of TOC or measuring point



Oil Specific Volume Calculation Spreadsheet for Free-phase Hydrocarbon in Monitoring Wells

Project No. 406  
Boring Designation RW-4

**DO NOT CHANGE ANY CELLS ON THIS WORKSHEET**

Z (feet)	h <sub>ow</sub> (feet)	h <sub>ao</sub> (feet)	S <sub>w</sub> (-)	S <sub>of</sub> (-)	φ S <sub>of</sub> dZ (ft <sup>3</sup> /ft <sup>2</sup> )
Z <sub>u</sub> = 618.04	1.61	1.51	0.9088	0.0000	0.0000
618.03	1.61	1.50	0.9091	0.0009	0.0000
618.02	1.60	1.49	0.9095	0.0018	0.0000
618.01	1.60	1.48	0.9098	0.0027	0.0000
618.00	1.60	1.48	0.9101	0.0035	0.0000
617.99	1.60	1.47	0.9105	0.0044	0.0000
617.98	1.59	1.46	0.9108	0.0052	0.0000
617.97	1.59	1.45	0.9112	0.0061	0.0000
617.96	1.59	1.45	0.9115	0.0069	0.0000
617.95	1.59	1.44	0.9118	0.0077	0.0000
617.94	1.59	1.43	0.9122	0.0086	0.0000
617.93	1.58	1.42	0.9125	0.0094	0.0000
617.92	1.58	1.42	0.9128	0.0102	0.0000
617.91	1.58	1.41	0.9132	0.0110	0.0000
617.90	1.58	1.40	0.9135	0.0118	0.0001
617.89	1.57	1.39	0.9138	0.0125	0.0001
617.88	1.57	1.38	0.9142	0.0133	0.0001
617.87	1.57	1.38	0.9145	0.0141	0.0001
617.86	1.57	1.37	0.9148	0.0148	0.0001
617.85	1.56	1.36	0.9152	0.0156	0.0001
617.84	1.56	1.35	0.9155	0.0163	0.0001
617.83	1.56	1.35	0.9158	0.0171	0.0001
617.82	1.56	1.34	0.9162	0.0178	0.0001
617.81	1.56	1.33	0.9165	0.0185	0.0001
617.80	1.55	1.32	0.9168	0.0192	0.0001
617.79	1.55	1.32	0.9171	0.0199	0.0001
617.78	1.55	1.31	0.9175	0.0206	0.0001
617.77	1.55	1.30	0.9178	0.0213	0.0001
617.76	1.54	1.29	0.9181	0.0219	0.0001
617.75	1.54	1.28	0.9184	0.0226	0.0001
617.74	1.54	1.28	0.9188	0.0233	0.0001
617.73	1.54	1.27	0.9191	0.0239	0.0001
617.72	1.54	1.26	0.9194	0.0245	0.0001
617.71	1.53	1.25	0.9197	0.0252	0.0001
617.70	1.53	1.25	0.9201	0.0258	0.0001
617.69	1.53	1.24	0.9204	0.0264	0.0001
617.68	1.53	1.23	0.9207	0.0270	0.0001
617.67	1.52	1.22	0.9210	0.0276	0.0001
617.66	1.52	1.21	0.9213	0.0282	0.0001
617.65	1.52	1.21	0.9217	0.0288	0.0001
617.64	1.52	1.20	0.9220	0.0293	0.0001
617.63	1.51	1.19	0.9223	0.0299	0.0001
617.62	1.51	1.18	0.9226	0.0305	0.0001
617.61	1.51	1.18	0.9229	0.0310	0.0001
617.60	1.51	1.17	0.9232	0.0315	0.0001
617.59	1.51	1.16	0.9235	0.0321	0.0001
617.58	1.50	1.15	0.9239	0.0326	0.0001
617.57	1.50	1.15	0.9242	0.0331	0.0001
617.56	1.50	1.14	0.9245	0.0336	0.0001
617.55	1.50	1.13	0.9248	0.0341	0.0001
617.54	1.49	1.12	0.9251	0.0346	0.0002
617.53	1.49	1.11	0.9254	0.0350	0.0002
617.52	1.49	1.11	0.9257	0.0355	0.0002
617.51	1.49	1.10	0.9260	0.0360	0.0002
617.50	1.49	1.09	0.9263	0.0364	0.0002
617.49	1.48	1.08	0.9266	0.0369	0.0002
617.48	1.48	1.08	0.9270	0.0373	0.0002
617.47	1.48	1.07	0.9273	0.0377	0.0002
617.46	1.48	1.06	0.9276	0.0381	0.0002
617.45	1.47	1.05	0.9279	0.0385	0.0002
617.44	1.47	1.04	0.9282	0.0389	0.0002
617.43	1.47	1.04	0.9285	0.0393	0.0002
617.42	1.47	1.03	0.9288	0.0397	0.0002
617.41	1.46	1.02	0.9291	0.0401	0.0002
617.40	1.46	1.01	0.9294	0.0405	0.0002
617.39	1.46	1.01	0.9297	0.0408	0.0002
617.38	1.46	1.00	0.9300	0.0412	0.0002
617.37	1.46	0.99	0.9303	0.0415	0.0002

$$Z_u = \rho_{ro} \beta_{ao} H_o / [\rho_{ro} \beta_{ao} - (1 - \rho_{ro}) \beta_{ow}]$$

= 618.04 feet

where:

ρ<sub>ro</sub> = 0.772

β<sub>ao</sub> = 2.90

β<sub>ow</sub> = 2.72

H<sub>o</sub> = 5.1 feet

Z<sub>ow</sub> = 610.99 feet

Z<sub>ao</sub> = 616.09 feet

Other parameters used in calculations (from Data Entry - MWs)

S<sub>m</sub> = 0.046

α = 0.125 /foot

n = 3.005

m = 0.667221298

dZ = 0.01 feet      Integration increment (0.01 to 1.0)

φ = 0.437

Oil Specific Volume

Σφ S<sub>of</sub> dZ = 5.3539E-02 ft<sup>3</sup>/ft<sup>2</sup>      Oil Specific Volume



617.36	1.45	0.98	0.9306	0.0418	0.0002
617.35	1.45	0.98	0.9309	0.0422	0.0002
617.34	1.45	0.97	0.9312	0.0425	0.0002
617.33	1.45	0.96	0.9315	0.0428	0.0002
617.32	1.44	0.95	0.9318	0.0431	0.0002
617.31	1.44	0.94	0.9321	0.0434	0.0002
617.30	1.44	0.94	0.9324	0.0437	0.0002
617.29	1.44	0.93	0.9326	0.0440	0.0002
617.28	1.43	0.92	0.9329	0.0442	0.0002
617.27	1.43	0.91	0.9332	0.0445	0.0002
617.26	1.43	0.91	0.9335	0.0447	0.0002
617.25	1.43	0.90	0.9338	0.0450	0.0002
617.24	1.43	0.89	0.9341	0.0452	0.0002
617.23	1.42	0.88	0.9344	0.0455	0.0002
617.22	1.42	0.88	0.9347	0.0457	0.0002
617.21	1.42	0.87	0.9350	0.0459	0.0002
617.20	1.42	0.86	0.9353	0.0461	0.0002
617.19	1.41	0.85	0.9355	0.0463	0.0002
617.18	1.41	0.84	0.9358	0.0465	0.0002
617.17	1.41	0.84	0.9361	0.0467	0.0002
617.16	1.41	0.83	0.9364	0.0469	0.0002
617.15	1.41	0.82	0.9367	0.0470	0.0002
617.14	1.40	0.81	0.9370	0.0472	0.0002
617.13	1.40	0.81	0.9372	0.0473	0.0002
617.12	1.40	0.80	0.9375	0.0475	0.0002
617.11	1.40	0.79	0.9378	0.0476	0.0002
617.10	1.39	0.78	0.9381	0.0478	0.0002
617.09	1.39	0.77	0.9384	0.0479	0.0002
617.08	1.39	0.77	0.9386	0.0480	0.0002
617.07	1.39	0.76	0.9389	0.0481	0.0002
617.06	1.38	0.75	0.9392	0.0482	0.0002
617.05	1.38	0.74	0.9395	0.0483	0.0002
617.04	1.38	0.74	0.9398	0.0484	0.0002
617.03	1.38	0.73	0.9400	0.0485	0.0002
617.02	1.38	0.72	0.9403	0.0486	0.0002
617.01	1.37	0.71	0.9406	0.0487	0.0002
617.00	1.37	0.71	0.9409	0.0487	0.0002
616.99	1.37	0.70	0.9411	0.0488	0.0002
616.98	1.37	0.69	0.9414	0.0489	0.0002
616.97	1.36	0.68	0.9417	0.0489	0.0002
616.96	1.36	0.67	0.9419	0.0490	0.0002
616.95	1.36	0.67	0.9422	0.0490	0.0002
616.94	1.36	0.66	0.9425	0.0490	0.0002
616.93	1.36	0.65	0.9427	0.0490	0.0002
616.92	1.35	0.64	0.9430	0.0491	0.0002
616.91	1.35	0.64	0.9433	0.0491	0.0002
616.90	1.35	0.63	0.9435	0.0491	0.0002
616.89	1.35	0.62	0.9438	0.0491	0.0002
616.88	1.34	0.61	0.9441	0.0491	0.0002
616.87	1.34	0.60	0.9443	0.0491	0.0002
616.86	1.34	0.60	0.9446	0.0491	0.0002
616.85	1.34	0.59	0.9449	0.0490	0.0002
616.84	1.33	0.58	0.9451	0.0490	0.0002
616.83	1.33	0.57	0.9454	0.0490	0.0002
616.82	1.33	0.57	0.9457	0.0489	0.0002
616.81	1.33	0.56	0.9459	0.0489	0.0002
616.80	1.33	0.55	0.9462	0.0488	0.0002
616.79	1.32	0.54	0.9464	0.0488	0.0002
616.78	1.32	0.54	0.9467	0.0487	0.0002
616.77	1.32	0.53	0.9469	0.0487	0.0002
616.76	1.32	0.52	0.9472	0.0486	0.0002
616.75	1.31	0.51	0.9475	0.0485	0.0002
616.74	1.31	0.50	0.9477	0.0485	0.0002
616.73	1.31	0.50	0.9480	0.0484	0.0002
616.72	1.31	0.49	0.9482	0.0483	0.0002
616.71	1.30	0.48	0.9485	0.0482	0.0002
616.70	1.30	0.47	0.9487	0.0481	0.0002
616.69	1.30	0.47	0.9490	0.0480	0.0002
616.68	1.30	0.46	0.9492	0.0479	0.0002
616.67	1.30	0.45	0.9495	0.0478	0.0002
616.66	1.29	0.44	0.9497	0.0477	0.0002
616.65	1.29	0.44	0.9500	0.0476	0.0002
616.64	1.29	0.43	0.9502	0.0474	0.0002
616.63	1.29	0.42	0.9505	0.0473	0.0002
616.62	1.28	0.41	0.9507	0.0472	0.0002
616.61	1.28	0.40	0.9510	0.0471	0.0002
616.60	1.28	0.40	0.9512	0.0469	0.0002
616.59	1.28	0.39	0.9514	0.0468	0.0002
616.58	1.28	0.38	0.9517	0.0467	0.0002

616.57	1.27	0.37	0.9519	0.0465	0.0002
616.56	1.27	0.37	0.9522	0.0464	0.0002
616.55	1.27	0.36	0.9524	0.0462	0.0002
616.54	1.27	0.35	0.9527	0.0461	0.0002
616.53	1.26	0.34	0.9529	0.0459	0.0002
616.52	1.26	0.33	0.9531	0.0457	0.0002
616.51	1.26	0.33	0.9534	0.0456	0.0002
616.50	1.26	0.32	0.9536	0.0454	0.0002
616.49	1.25	0.31	0.9539	0.0452	0.0002
616.48	1.25	0.30	0.9541	0.0451	0.0002
616.47	1.25	0.30	0.9543	0.0449	0.0002
616.46	1.25	0.29	0.9546	0.0447	0.0002
616.45	1.25	0.28	0.9548	0.0445	0.0002
616.44	1.24	0.27	0.9550	0.0444	0.0002
616.43	1.24	0.27	0.9553	0.0442	0.0002
616.42	1.24	0.26	0.9555	0.0440	0.0002
616.41	1.24	0.25	0.9557	0.0438	0.0002
616.40	1.23	0.24	0.9560	0.0436	0.0002
616.39	1.23	0.23	0.9562	0.0434	0.0002
616.38	1.23	0.23	0.9564	0.0432	0.0002
616.37	1.23	0.22	0.9566	0.0430	0.0002
616.36	1.23	0.21	0.9569	0.0428	0.0002
616.35	1.22	0.20	0.9571	0.0426	0.0002
616.34	1.22	0.20	0.9573	0.0424	0.0002
616.33	1.22	0.19	0.9576	0.0422	0.0002
616.32	1.22	0.18	0.9578	0.0420	0.0002
616.31	1.21	0.17	0.9580	0.0418	0.0002
616.30	1.21	0.16	0.9582	0.0416	0.0002
616.29	1.21	0.16	0.9584	0.0414	0.0002
616.28	1.21	0.15	0.9587	0.0412	0.0002
616.27	1.20	0.14	0.9589	0.0410	0.0002
616.26	1.20	0.13	0.9591	0.0408	0.0002
616.25	1.20	0.13	0.9593	0.0406	0.0002
616.24	1.20	0.12	0.9596	0.0404	0.0002
616.23	1.20	0.11	0.9598	0.0402	0.0002
616.22	1.19	0.10	0.9600	0.0400	0.0002
616.21	1.19	0.10	0.9602	0.0398	0.0002
616.20	1.19	0.09	0.9604	0.0396	0.0002
616.19	1.19	0.08	0.9606	0.0393	0.0002
616.18	1.18	0.07	0.9609	0.0391	0.0002
616.17	1.18	0.06	0.9611	0.0389	0.0002
616.16	1.18	0.06	0.9613	0.0387	0.0002
616.15	1.18	0.05	0.9615	0.0385	0.0002
616.14	1.17	0.04	0.9617	0.0383	0.0002
616.13	1.17	0.03	0.9619	0.0381	0.0002
616.12	1.17	0.03	0.9621	0.0379	0.0002
616.11	1.17	0.02	0.9623	0.0377	0.0002
616.10	1.17	0.01	0.9626	0.0374	0.0002
616.09	1.16	0.00	0.9628	0.0372	0.0002
616.08	1.16	0.00	0.9630	0.0370	0.0002
616.07	1.16	0.00	0.9632	0.0368	0.0002
616.06	1.16	0.00	0.9634	0.0366	0.0002
616.05	1.15	0.00	0.9636	0.0364	0.0002
616.04	1.15	0.00	0.9638	0.0362	0.0002
616.03	1.15	0.00	0.9640	0.0360	0.0002
616.02	1.15	0.00	0.9642	0.0358	0.0002
616.01	1.15	0.00	0.9644	0.0356	0.0002
616.00	1.14	0.00	0.9646	0.0354	0.0002
615.99	1.14	0.00	0.9648	0.0352	0.0002
615.98	1.14	0.00	0.9650	0.0350	0.0002
615.97	1.14	0.00	0.9652	0.0348	0.0002
615.96	1.13	0.00	0.9654	0.0346	0.0002
615.95	1.13	0.00	0.9656	0.0344	0.0002
615.94	1.13	0.00	0.9658	0.0342	0.0001
615.93	1.13	0.00	0.9660	0.0340	0.0001
615.92	1.12	0.00	0.9662	0.0338	0.0001
615.91	1.12	0.00	0.9664	0.0336	0.0001
615.90	1.12	0.00	0.9666	0.0334	0.0001
615.89	1.12	0.00	0.9668	0.0332	0.0001
615.88	1.12	0.00	0.9670	0.0330	0.0001
615.87	1.11	0.00	0.9672	0.0328	0.0001
615.86	1.11	0.00	0.9674	0.0326	0.0001
615.85	1.11	0.00	0.9676	0.0324	0.0001
615.84	1.11	0.00	0.9678	0.0322	0.0001
615.83	1.10	0.00	0.9680	0.0320	0.0001
615.82	1.10	0.00	0.9681	0.0319	0.0001
615.81	1.10	0.00	0.9683	0.0317	0.0001
615.80	1.10	0.00	0.9685	0.0315	0.0001
615.79	1.10	0.00	0.9687	0.0313	0.0001

615.78	1.09	0.00	0.9689	0.0311	0.0001
615.77	1.09	0.00	0.9691	0.0309	0.0001
615.76	1.09	0.00	0.9693	0.0307	0.0001
615.75	1.09	0.00	0.9695	0.0305	0.0001
615.74	1.08	0.00	0.9696	0.0304	0.0001
615.73	1.08	0.00	0.9698	0.0302	0.0001
615.72	1.08	0.00	0.9700	0.0300	0.0001
615.71	1.08	0.00	0.9702	0.0298	0.0001
615.70	1.07	0.00	0.9704	0.0296	0.0001
615.69	1.07	0.00	0.9706	0.0294	0.0001
615.68	1.07	0.00	0.9707	0.0293	0.0001
615.67	1.07	0.00	0.9709	0.0291	0.0001
615.66	1.07	0.00	0.9711	0.0289	0.0001
615.65	1.06	0.00	0.9713	0.0287	0.0001
615.64	1.06	0.00	0.9714	0.0286	0.0001
615.63	1.06	0.00	0.9716	0.0284	0.0001
615.62	1.06	0.00	0.9718	0.0282	0.0001
615.61	1.05	0.00	0.9720	0.0280	0.0001
615.60	1.05	0.00	0.9722	0.0278	0.0001
615.59	1.05	0.00	0.9723	0.0277	0.0001
615.58	1.05	0.00	0.9725	0.0275	0.0001
615.57	1.05	0.00	0.9727	0.0273	0.0001
615.56	1.04	0.00	0.9728	0.0272	0.0001
615.55	1.04	0.00	0.9730	0.0270	0.0001
615.54	1.04	0.00	0.9732	0.0268	0.0001
615.53	1.04	0.00	0.9734	0.0266	0.0001
615.52	1.03	0.00	0.9735	0.0265	0.0001
615.51	1.03	0.00	0.9737	0.0263	0.0001
615.50	1.03	0.00	0.9739	0.0261	0.0001
615.49	1.03	0.00	0.9740	0.0260	0.0001
615.48	1.02	0.00	0.9742	0.0258	0.0001
615.47	1.02	0.00	0.9744	0.0256	0.0001
615.46	1.02	0.00	0.9745	0.0255	0.0001
615.45	1.02	0.00	0.9747	0.0253	0.0001
615.44	1.02	0.00	0.9749	0.0251	0.0001
615.43	1.01	0.00	0.9750	0.0250	0.0001
615.42	1.01	0.00	0.9752	0.0248	0.0001
615.41	1.01	0.00	0.9754	0.0246	0.0001
615.40	1.01	0.00	0.9755	0.0245	0.0001
615.39	1.00	0.00	0.9757	0.0243	0.0001
615.38	1.00	0.00	0.9758	0.0242	0.0001
615.37	1.00	0.00	0.9760	0.0240	0.0001
615.36	1.00	0.00	0.9762	0.0238	0.0001
615.35	0.99	0.00	0.9763	0.0237	0.0001
615.34	0.99	0.00	0.9765	0.0235	0.0001
615.33	0.99	0.00	0.9766	0.0234	0.0001
615.32	0.99	0.00	0.9768	0.0232	0.0001
615.31	0.99	0.00	0.9769	0.0231	0.0001
615.30	0.98	0.00	0.9771	0.0229	0.0001
615.29	0.98	0.00	0.9772	0.0228	0.0001
615.28	0.98	0.00	0.9774	0.0226	0.0001
615.27	0.98	0.00	0.9776	0.0224	0.0001
615.26	0.97	0.00	0.9777	0.0223	0.0001
615.25	0.97	0.00	0.9779	0.0221	0.0001
615.24	0.97	0.00	0.9780	0.0220	0.0001
615.23	0.97	0.00	0.9782	0.0218	0.0001
615.22	0.97	0.00	0.9783	0.0217	0.0001
615.21	0.96	0.00	0.9785	0.0215	0.0001
615.20	0.96	0.00	0.9786	0.0214	0.0001
615.19	0.96	0.00	0.9788	0.0212	0.0001
615.18	0.96	0.00	0.9789	0.0211	0.0001
615.17	0.95	0.00	0.9791	0.0209	0.0001
615.16	0.95	0.00	0.9792	0.0208	0.0001
615.15	0.95	0.00	0.9793	0.0207	0.0001
615.14	0.95	0.00	0.9795	0.0205	0.0001
615.13	0.94	0.00	0.9796	0.0204	0.0001
615.12	0.94	0.00	0.9798	0.0202	0.0001
615.11	0.94	0.00	0.9799	0.0201	0.0001
615.10	0.94	0.00	0.9801	0.0199	0.0001
615.09	0.94	0.00	0.9802	0.0198	0.0001
615.08	0.93	0.00	0.9803	0.0197	0.0001
615.07	0.93	0.00	0.9805	0.0195	0.0001
615.06	0.93	0.00	0.9806	0.0194	0.0001
615.05	0.93	0.00	0.9808	0.0192	0.0001
615.04	0.92	0.00	0.9809	0.0191	0.0001
615.03	0.92	0.00	0.9810	0.0190	0.0001
615.02	0.92	0.00	0.9812	0.0188	0.0001
615.01	0.92	0.00	0.9813	0.0187	0.0001
615.00	0.92	0.00	0.9814	0.0186	0.0001

614.99	0.91	0.00	0.9816	0.0184	0.0001
614.98	0.91	0.00	0.9817	0.0183	0.0001
614.97	0.91	0.00	0.9819	0.0181	0.0001
614.96	0.91	0.00	0.9820	0.0180	0.0001
614.95	0.90	0.00	0.9821	0.0179	0.0001
614.94	0.90	0.00	0.9822	0.0178	0.0001
614.93	0.90	0.00	0.9824	0.0176	0.0001
614.92	0.90	0.00	0.9825	0.0175	0.0001
614.91	0.89	0.00	0.9826	0.0174	0.0001
614.90	0.89	0.00	0.9828	0.0172	0.0001
614.89	0.89	0.00	0.9829	0.0171	0.0001
614.88	0.89	0.00	0.9830	0.0170	0.0001
614.87	0.89	0.00	0.9832	0.0168	0.0001
614.86	0.88	0.00	0.9833	0.0167	0.0001
614.85	0.88	0.00	0.9834	0.0166	0.0001
614.84	0.88	0.00	0.9835	0.0165	0.0001
614.83	0.88	0.00	0.9837	0.0163	0.0001
614.82	0.87	0.00	0.9838	0.0162	0.0001
614.81	0.87	0.00	0.9839	0.0161	0.0001
614.80	0.87	0.00	0.9840	0.0160	0.0001
614.79	0.87	0.00	0.9842	0.0158	0.0001
614.78	0.86	0.00	0.9843	0.0157	0.0001
614.77	0.86	0.00	0.9844	0.0156	0.0001
614.76	0.86	0.00	0.9845	0.0155	0.0001
614.75	0.86	0.00	0.9846	0.0154	0.0001
614.74	0.86	0.00	0.9848	0.0152	0.0001
614.73	0.85	0.00	0.9849	0.0151	0.0001
614.72	0.85	0.00	0.9850	0.0150	0.0001
614.71	0.85	0.00	0.9851	0.0149	0.0001
614.70	0.85	0.00	0.9852	0.0148	0.0001
614.69	0.84	0.00	0.9854	0.0146	0.0001
614.68	0.84	0.00	0.9855	0.0145	0.0001
614.67	0.84	0.00	0.9856	0.0144	0.0001
614.66	0.84	0.00	0.9857	0.0143	0.0001
614.65	0.84	0.00	0.9858	0.0142	0.0001
614.64	0.83	0.00	0.9859	0.0141	0.0001
614.63	0.83	0.00	0.9860	0.0140	0.0001
614.62	0.83	0.00	0.9862	0.0138	0.0001
614.61	0.83	0.00	0.9863	0.0137	0.0001
614.60	0.82	0.00	0.9864	0.0136	0.0001
614.59	0.82	0.00	0.9865	0.0135	0.0001
614.58	0.82	0.00	0.9866	0.0134	0.0001
614.57	0.82	0.00	0.9867	0.0133	0.0001
614.56	0.81	0.00	0.9868	0.0132	0.0001
614.55	0.81	0.00	0.9869	0.0131	0.0001
614.54	0.81	0.00	0.9870	0.0130	0.0001
614.53	0.81	0.00	0.9871	0.0129	0.0001
614.52	0.81	0.00	0.9872	0.0128	0.0001
614.51	0.80	0.00	0.9874	0.0126	0.0001
614.50	0.80	0.00	0.9875	0.0125	0.0001
614.49	0.80	0.00	0.9876	0.0124	0.0001
614.48	0.80	0.00	0.9877	0.0123	0.0001
614.47	0.79	0.00	0.9878	0.0122	0.0001
614.46	0.79	0.00	0.9879	0.0121	0.0001
614.45	0.79	0.00	0.9880	0.0120	0.0001
614.44	0.79	0.00	0.9881	0.0119	0.0001
614.43	0.79	0.00	0.9882	0.0118	0.0001
614.42	0.78	0.00	0.9883	0.0117	0.0001
614.41	0.78	0.00	0.9884	0.0116	0.0001
614.40	0.78	0.00	0.9885	0.0115	0.0001
614.39	0.78	0.00	0.9886	0.0114	0.0000
614.38	0.77	0.00	0.9887	0.0113	0.0000
614.37	0.77	0.00	0.9888	0.0112	0.0000
614.36	0.77	0.00	0.9889	0.0111	0.0000
614.35	0.77	0.00	0.9890	0.0110	0.0000
614.34	0.76	0.00	0.9891	0.0109	0.0000
614.33	0.76	0.00	0.9892	0.0108	0.0000
614.32	0.76	0.00	0.9893	0.0107	0.0000
614.31	0.76	0.00	0.9894	0.0106	0.0000
614.30	0.76	0.00	0.9895	0.0105	0.0000
614.29	0.75	0.00	0.9896	0.0104	0.0000
614.28	0.75	0.00	0.9896	0.0104	0.0000
614.27	0.75	0.00	0.9897	0.0103	0.0000
614.26	0.75	0.00	0.9898	0.0102	0.0000
614.25	0.74	0.00	0.9899	0.0101	0.0000
614.24	0.74	0.00	0.9900	0.0100	0.0000
614.23	0.74	0.00	0.9901	0.0099	0.0000
614.22	0.74	0.00	0.9902	0.0098	0.0000
614.21	0.73	0.00	0.9903	0.0097	0.0000

614.20	0.73	0.00	0.9904	0.0096	0.0000
614.19	0.73	0.00	0.9905	0.0095	0.0000
614.18	0.73	0.00	0.9906	0.0094	0.0000
614.17	0.73	0.00	0.9906	0.0094	0.0000
614.16	0.72	0.00	0.9907	0.0093	0.0000
614.15	0.72	0.00	0.9908	0.0092	0.0000
614.14	0.72	0.00	0.9909	0.0091	0.0000
614.13	0.72	0.00	0.9910	0.0090	0.0000
614.12	0.71	0.00	0.9911	0.0089	0.0000
614.11	0.71	0.00	0.9912	0.0088	0.0000
614.10	0.71	0.00	0.9912	0.0088	0.0000
614.09	0.71	0.00	0.9913	0.0087	0.0000
614.08	0.71	0.00	0.9914	0.0086	0.0000
614.07	0.70	0.00	0.9915	0.0085	0.0000
614.06	0.70	0.00	0.9916	0.0084	0.0000
614.05	0.70	0.00	0.9916	0.0084	0.0000
614.04	0.70	0.00	0.9917	0.0083	0.0000
614.03	0.69	0.00	0.9918	0.0082	0.0000
614.02	0.69	0.00	0.9919	0.0081	0.0000
614.01	0.69	0.00	0.9920	0.0080	0.0000
614.00	0.69	0.00	0.9920	0.0080	0.0000
613.99	0.68	0.00	0.9921	0.0079	0.0000
613.98	0.68	0.00	0.9922	0.0078	0.0000
613.97	0.68	0.00	0.9923	0.0077	0.0000
613.96	0.68	0.00	0.9924	0.0076	0.0000
613.95	0.68	0.00	0.9924	0.0076	0.0000
613.94	0.67	0.00	0.9925	0.0075	0.0000
613.93	0.67	0.00	0.9926	0.0074	0.0000
613.92	0.67	0.00	0.9927	0.0073	0.0000
613.91	0.67	0.00	0.9927	0.0073	0.0000
613.90	0.66	0.00	0.9928	0.0072	0.0000
613.89	0.66	0.00	0.9929	0.0071	0.0000
613.88	0.66	0.00	0.9930	0.0070	0.0000
613.87	0.66	0.00	0.9930	0.0070	0.0000
613.86	0.66	0.00	0.9931	0.0069	0.0000
613.85	0.65	0.00	0.9932	0.0068	0.0000
613.84	0.65	0.00	0.9932	0.0068	0.0000
613.83	0.65	0.00	0.9933	0.0067	0.0000
613.82	0.65	0.00	0.9934	0.0066	0.0000
613.81	0.64	0.00	0.9934	0.0066	0.0000
613.80	0.64	0.00	0.9935	0.0065	0.0000
613.79	0.64	0.00	0.9936	0.0064	0.0000
613.78	0.64	0.00	0.9937	0.0063	0.0000
613.77	0.63	0.00	0.9937	0.0063	0.0000
613.76	0.63	0.00	0.9938	0.0062	0.0000
613.75	0.63	0.00	0.9939	0.0061	0.0000
613.74	0.63	0.00	0.9939	0.0061	0.0000
613.73	0.63	0.00	0.9940	0.0060	0.0000
613.72	0.62	0.00	0.9941	0.0059	0.0000
613.71	0.62	0.00	0.9941	0.0059	0.0000
613.70	0.62	0.00	0.9942	0.0058	0.0000
613.69	0.62	0.00	0.9942	0.0058	0.0000
613.68	0.61	0.00	0.9943	0.0057	0.0000
613.67	0.61	0.00	0.9944	0.0056	0.0000
613.66	0.61	0.00	0.9944	0.0056	0.0000
613.65	0.61	0.00	0.9945	0.0055	0.0000
613.64	0.60	0.00	0.9946	0.0054	0.0000
613.63	0.60	0.00	0.9946	0.0054	0.0000
613.62	0.60	0.00	0.9947	0.0053	0.0000
613.61	0.60	0.00	0.9947	0.0053	0.0000
613.60	0.60	0.00	0.9948	0.0052	0.0000
613.59	0.59	0.00	0.9949	0.0051	0.0000
613.58	0.59	0.00	0.9949	0.0051	0.0000
613.57	0.59	0.00	0.9950	0.0050	0.0000
613.56	0.59	0.00	0.9950	0.0050	0.0000
613.55	0.58	0.00	0.9951	0.0049	0.0000
613.54	0.58	0.00	0.9951	0.0049	0.0000
613.53	0.58	0.00	0.9952	0.0048	0.0000
613.52	0.58	0.00	0.9953	0.0047	0.0000
613.51	0.58	0.00	0.9953	0.0047	0.0000
613.50	0.57	0.00	0.9954	0.0046	0.0000
613.49	0.57	0.00	0.9954	0.0046	0.0000
613.48	0.57	0.00	0.9955	0.0045	0.0000
613.47	0.57	0.00	0.9955	0.0045	0.0000
613.46	0.56	0.00	0.9956	0.0044	0.0000
613.45	0.56	0.00	0.9956	0.0044	0.0000
613.44	0.56	0.00	0.9957	0.0043	0.0000
613.43	0.56	0.00	0.9957	0.0043	0.0000
613.42	0.55	0.00	0.9958	0.0042	0.0000

613.41	0.55	0.00	0.9958	0.0042	0.0000
613.40	0.55	0.00	0.9959	0.0041	0.0000
613.39	0.55	0.00	0.9959	0.0041	0.0000
613.38	0.55	0.00	0.9960	0.0040	0.0000
613.37	0.54	0.00	0.9960	0.0040	0.0000
613.36	0.54	0.00	0.9961	0.0039	0.0000
613.35	0.54	0.00	0.9961	0.0039	0.0000
613.34	0.54	0.00	0.9962	0.0038	0.0000
613.33	0.53	0.00	0.9962	0.0038	0.0000
613.32	0.53	0.00	0.9963	0.0037	0.0000
613.31	0.53	0.00	0.9963	0.0037	0.0000
613.30	0.53	0.00	0.9964	0.0036	0.0000
613.29	0.53	0.00	0.9964	0.0036	0.0000
613.28	0.52	0.00	0.9965	0.0035	0.0000
613.27	0.52	0.00	0.9965	0.0035	0.0000
613.26	0.52	0.00	0.9966	0.0034	0.0000
613.25	0.52	0.00	0.9966	0.0034	0.0000
613.24	0.51	0.00	0.9967	0.0033	0.0000
613.23	0.51	0.00	0.9967	0.0033	0.0000
613.22	0.51	0.00	0.9967	0.0033	0.0000
613.21	0.51	0.00	0.9968	0.0032	0.0000
613.20	0.50	0.00	0.9968	0.0032	0.0000
613.19	0.50	0.00	0.9969	0.0031	0.0000
613.18	0.50	0.00	0.9969	0.0031	0.0000
613.17	0.50	0.00	0.9970	0.0030	0.0000
613.16	0.50	0.00	0.9970	0.0030	0.0000
613.15	0.49	0.00	0.9970	0.0030	0.0000
613.14	0.49	0.00	0.9971	0.0029	0.0000
613.13	0.49	0.00	0.9971	0.0029	0.0000
613.12	0.49	0.00	0.9972	0.0028	0.0000
613.11	0.48	0.00	0.9972	0.0028	0.0000
613.10	0.48	0.00	0.9972	0.0028	0.0000
613.09	0.48	0.00	0.9973	0.0027	0.0000
613.08	0.48	0.00	0.9973	0.0027	0.0000
613.07	0.48	0.00	0.9974	0.0026	0.0000
613.06	0.47	0.00	0.9974	0.0026	0.0000
613.05	0.47	0.00	0.9974	0.0026	0.0000
613.04	0.47	0.00	0.9975	0.0025	0.0000
613.03	0.47	0.00	0.9975	0.0025	0.0000
613.02	0.46	0.00	0.9975	0.0025	0.0000
613.01	0.46	0.00	0.9976	0.0024	0.0000
613.00	0.46	0.00	0.9976	0.0024	0.0000
612.99	0.46	0.00	0.9977	0.0023	0.0000
612.98	0.45	0.00	0.9977	0.0023	0.0000
612.97	0.45	0.00	0.9977	0.0023	0.0000
612.96	0.45	0.00	0.9978	0.0022	0.0000
612.95	0.45	0.00	0.9978	0.0022	0.0000
612.94	0.45	0.00	0.9978	0.0022	0.0000
612.93	0.44	0.00	0.9979	0.0021	0.0000
612.92	0.44	0.00	0.9979	0.0021	0.0000
612.91	0.44	0.00	0.9979	0.0021	0.0000
612.90	0.44	0.00	0.9980	0.0020	0.0000
612.89	0.43	0.00	0.9980	0.0020	0.0000
612.88	0.43	0.00	0.9980	0.0020	0.0000
612.87	0.43	0.00	0.9980	0.0020	0.0000
612.86	0.43	0.00	0.9981	0.0019	0.0000
612.85	0.42	0.00	0.9981	0.0019	0.0000
612.84	0.42	0.00	0.9981	0.0019	0.0000
612.83	0.42	0.00	0.9982	0.0018	0.0000
612.82	0.42	0.00	0.9982	0.0018	0.0000
612.81	0.42	0.00	0.9982	0.0018	0.0000
612.80	0.41	0.00	0.9983	0.0017	0.0000
612.79	0.41	0.00	0.9983	0.0017	0.0000
612.78	0.41	0.00	0.9983	0.0017	0.0000
612.77	0.41	0.00	0.9983	0.0017	0.0000
612.76	0.40	0.00	0.9984	0.0016	0.0000
612.75	0.40	0.00	0.9984	0.0016	0.0000
612.74	0.40	0.00	0.9984	0.0016	0.0000
612.73	0.40	0.00	0.9985	0.0015	0.0000
612.72	0.40	0.00	0.9985	0.0015	0.0000
612.71	0.39	0.00	0.9985	0.0015	0.0000
612.70	0.39	0.00	0.9985	0.0015	0.0000
612.69	0.39	0.00	0.9986	0.0014	0.0000
612.68	0.39	0.00	0.9986	0.0014	0.0000
612.67	0.38	0.00	0.9986	0.0014	0.0000
612.66	0.38	0.00	0.9986	0.0014	0.0000
612.65	0.38	0.00	0.9987	0.0013	0.0000
612.64	0.38	0.00	0.9987	0.0013	0.0000
612.63	0.37	0.00	0.9987	0.0013	0.0000







	611.04	0.01	0.00	1.0000	0.0000	0.0000
	611.03	0.01	0.00	1.0000	0.0000	0.0000
	611.02	0.01	0.00	1.0000	0.0000	0.0000
	611.01	0.01	0.00	1.0000	0.0000	0.0000
	611.00	0.00	0.00	1.0000	0.0000	0.0000
	610.99	0.00	0.00	1.0000	0.0000	0.0000
Zow =	610.99	0.00	0.00	1.0000	0.0000	0.0000
				Oil Specific Volume	0.0535	ft <sup>3</sup> /ft <sup>2</sup>

Data Entry Worksheet for Soil Samples -- Oil Specific Volume (OSV) Calculations

Project No. = 406   = User must enter the soil or fluid parameter, or lab data, as appropriate  
 Boring Designation = RW-5

Soil Parameters

Fluid Parameters

Oil Parameters

Required to Estimate OSV - Soil

Required to Estimate OSV - Soil

$\rho_b = 1.6 \text{ g/cm}^3$  Bulk density of soil

$\rho_o = 0.7903 \text{ g/cm}^3$  Oil density

Soil Sample Data

Sample Intervals (maximum 21 samples)

	Feet (bgs)	to	Feet (bgs)	GRO or DRO (mg/kg)
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				

Deepest sample must be entered in this row

## Data Entry Worksheet for Monitoring Well Fluid Data -- Oil Specific Volume (OSV) Calculations

Project No. = 406  
Boring Designation = RW-5

= User must enter the soil or fluid parameter, or lab data, as appropriate

### Soil Parameters

#### Required to Estimate OSV - MWs

$\phi$  = 0.437 Total porosity

$\sigma_{ow}$  = 18.2 dynes/cm Oil/Water Interfacial Tension

$\sigma_{ao}$  = 22.7 dynes/cm Air/Oil Surface Tension

$\sigma_{aw}$  = 62.1 dynes/cm Air/Water Surface Tension

$\alpha$  = 0.125 /foot Van Genuchten mean pore-size parameter

$n$  = 3.00500 Van Genuchten pore-size distribution exponent

$S_m$  = 0.046 Irreducible water saturation

### Fluid Parameters

$\rho_{ro}$  = 0.7903 Ratio of oil to water density

$\beta_{ao}$  = 2.74 Ratio of water surface tension to oil surface tension

$\beta_{ow}$  = 3.41 Ratio of water surface tension to oil-water interfacial tension

$Z_{ow}$  = 23.09 feet Depth to oil/air interface

$Z_{ao}$  = 23.92 feet Depth to oil/water interface

$S_m$  = 0.046 Water saturation at field capacity

$\alpha$  = 0.125 /foot Van Genuchten mean pore-size parameter

$n$  = 3.00500 Van Genuchten pore-size distribution exponent

$m$  = 0.667221 Calculated from "n"

$dZ$  = 0.01 feet Integration increment (0.01 to 1.0)

TOC = 638.61 feet Elevation of TOC or measuring point



Oil Specific Volume Calculation Spreadsheet for Free-phase Hydrocarbon in Monitoring Wells

Project No. 406  
Boring Designation RW-5

**DO NOT CHANGE ANY CELLS ON THIS WORKSHEET**

Z (feet)	h <sub>ow</sub> (feet)	h <sub>ao</sub> (feet)	S <sub>w</sub> (-)	S <sub>of</sub> (-)	φ S <sub>of</sub> dZ (ft <sup>3</sup> /ft <sup>2</sup> )
Z <sub>u</sub> = 615.93	0.26	0.32	0.9991	0.0000	0.0000
615.92	0.26	0.32	0.9992	0.0000	0.0000
615.91	0.26	0.31	0.9992	0.0001	0.0000
615.90	0.25	0.30	0.9992	0.0001	0.0000
615.89	0.25	0.29	0.9992	0.0001	0.0000
615.88	0.25	0.28	0.9992	0.0002	0.0000
615.87	0.25	0.28	0.9993	0.0002	0.0000
615.86	0.25	0.27	0.9993	0.0002	0.0000
615.85	0.24	0.26	0.9993	0.0003	0.0000
615.84	0.24	0.25	0.9993	0.0003	0.0000
615.83	0.24	0.25	0.9993	0.0003	0.0000
615.82	0.24	0.24	0.9993	0.0003	0.0000
615.81	0.23	0.23	0.9994	0.0003	0.0000
615.80	0.23	0.22	0.9994	0.0003	0.0000
615.79	0.23	0.21	0.9994	0.0004	0.0000
615.78	0.23	0.21	0.9994	0.0004	0.0000
615.77	0.23	0.20	0.9994	0.0004	0.0000
615.76	0.22	0.19	0.9994	0.0004	0.0000
615.75	0.22	0.18	0.9995	0.0004	0.0000
615.74	0.22	0.17	0.9995	0.0004	0.0000
615.73	0.22	0.17	0.9995	0.0004	0.0000
615.72	0.22	0.16	0.9995	0.0004	0.0000
615.71	0.21	0.15	0.9995	0.0004	0.0000
615.70	0.21	0.14	0.9995	0.0004	0.0000
615.69	0.21	0.13	0.9995	0.0004	0.0000
615.68	0.21	0.13	0.9996	0.0004	0.0000
615.67	0.21	0.12	0.9996	0.0004	0.0000
615.66	0.20	0.11	0.9996	0.0004	0.0000
615.65	0.20	0.10	0.9996	0.0004	0.0000
615.64	0.20	0.10	0.9996	0.0004	0.0000
615.63	0.20	0.09	0.9996	0.0004	0.0000
615.62	0.20	0.08	0.9996	0.0003	0.0000
615.61	0.19	0.07	0.9996	0.0003	0.0000
615.60	0.19	0.06	0.9997	0.0003	0.0000
615.59	0.19	0.06	0.9997	0.0003	0.0000
615.58	0.19	0.05	0.9997	0.0003	0.0000
615.57	0.18	0.04	0.9997	0.0003	0.0000
615.56	0.18	0.03	0.9997	0.0003	0.0000
615.55	0.18	0.02	0.9997	0.0003	0.0000
615.54	0.18	0.02	0.9997	0.0003	0.0000
615.53	0.18	0.01	0.9997	0.0003	0.0000
615.52	0.17	0.00	0.9997	0.0003	0.0000
615.51	0.17	0.00	0.9998	0.0002	0.0000
615.50	0.17	0.00	0.9998	0.0002	0.0000
615.49	0.17	0.00	0.9998	0.0002	0.0000
615.48	0.17	0.00	0.9998	0.0002	0.0000
615.47	0.16	0.00	0.9998	0.0002	0.0000
615.46	0.16	0.00	0.9998	0.0002	0.0000
615.45	0.16	0.00	0.9998	0.0002	0.0000
615.44	0.16	0.00	0.9998	0.0002	0.0000
615.43	0.16	0.00	0.9998	0.0002	0.0000
615.42	0.15	0.00	0.9998	0.0002	0.0000
615.41	0.15	0.00	0.9998	0.0002	0.0000
615.40	0.15	0.00	0.9998	0.0002	0.0000
615.39	0.15	0.00	0.9998	0.0002	0.0000
615.38	0.14	0.00	0.9999	0.0001	0.0000
615.37	0.14	0.00	0.9999	0.0001	0.0000
615.36	0.14	0.00	0.9999	0.0001	0.0000
615.35	0.14	0.00	0.9999	0.0001	0.0000
615.34	0.14	0.00	0.9999	0.0001	0.0000
615.33	0.13	0.00	0.9999	0.0001	0.0000
615.32	0.13	0.00	0.9999	0.0001	0.0000
615.31	0.13	0.00	0.9999	0.0001	0.0000
615.30	0.13	0.00	0.9999	0.0001	0.0000
615.29	0.13	0.00	0.9999	0.0001	0.0000
615.28	0.12	0.00	0.9999	0.0001	0.0000
615.27	0.12	0.00	0.9999	0.0001	0.0000
615.26	0.12	0.00	0.9999	0.0001	0.0000

$$Z_u = \rho_{ro} \beta_{ao} H_o / [\rho_{ro} \beta_{ao} - (1 - \rho_{ro}) \beta_{ow}]$$

= 615.93 feet

where:

ρ<sub>ro</sub> = 0.7903

β<sub>ao</sub> = 2.74

β<sub>ow</sub> = 3.41

H<sub>o</sub> = 0.83 feet

Z<sub>ow</sub> = 614.69 feet

Z<sub>ao</sub> = 615.52 feet

Other parameters used in calculations (from Data Entry - MWs)

S<sub>m</sub> = 0.046

α = 0.125 /foot

n = 3.005

m = 0.667221298

dZ = 0.01 feet      Integration increment (0.01 to 1.0)

φ = 0.437

Oil Specific Volume

Σφ S<sub>of</sub> dZ = 7.7818E-05 ft<sup>3</sup>/ft<sup>2</sup>      Oil Specific Volume











Data Entry Worksheet for Soil Samples -- Oil Specific Volume (OSV) Calculations

Project No. = 406 [ ] = User must enter the soil or fluid parameter, or lab data, as appropriate  
Boring Designation = RW-6

Soil Parameters

Fluid Parameters

Oil Parameters

Required to Estimate OSV - Soil

Required to Estimate OSV - Soil

$\rho_b = 1.6 \text{ g/cm}^3$  Bulk density of soil

$\rho_o = 0.7903 \text{ g/cm}^3$  Oil density

Soil Sample Data

Sample Intervals (maximum 21 samples)

	Feet (bgs)	to	Feet (bgs)	GRO or DRO (mg/kg)
1	[ ]		[ ]	[ ]
2	[ ]		[ ]	[ ]
3	[ ]		[ ]	[ ]
4	[ ]		[ ]	[ ]
5	[ ]		[ ]	[ ]
6	[ ]		[ ]	[ ]
7	[ ]		[ ]	[ ]
8	[ ]		[ ]	[ ]
9	[ ]		[ ]	[ ]
10	[ ]		[ ]	[ ]
11	[ ]		[ ]	[ ]
12	[ ]		[ ]	[ ]
13	[ ]		[ ]	[ ]
14	[ ]		[ ]	[ ]
15	[ ]		[ ]	[ ]
16	[ ]		[ ]	[ ]
17	[ ]		[ ]	[ ]
18	[ ]		[ ]	[ ]
19	[ ]		[ ]	[ ]
20	[ ]		[ ]	[ ]
21	[ ]		[ ]	[ ]

Deepest sample must be entered in this row

Data Entry Worksheet for Monitoring Well Fluid Data -- Oil Specific Volume (OSV) Calculations

Project No. = 406  
Boring Designation = RW-6

[ ] = User must enter the soil or fluid parameter, or lab data, as appropriate

Soil Parameters

Required to Estimate OSV - MWs

$\phi$  = 0.437 Total porosity  
 $\sigma_{ow}$  = 18.2 dynes/cm Oil/Water Interfacial Tension  
 $\sigma_{ao}$  = 22.7 dynes/cm Air/Oil Surface Tension  
 $\sigma_{aw}$  = 62.1 dynes/cm Air/Water Surface Tension  
 $\alpha$  = 0.2301 /foot Van Genuchten mean pore-size parameter  
 $n$  = 2.56783 Van Genuchten pore-size distribution exponent  
 $S_m$  = 0.1042 Irreducible water saturation

Fluid Parameters

$\rho_{ro}$  = 0.7903 Ratio of oil to water density  
 $\beta_{ao}$  = 2.74 Ratio of water surface tension to oil surface tension  
 $\beta_{ow}$  = 3.41 Ratio of water surface tension to oil-water interfacial tension  
 $Z_{ow}$  = 19.29 feet Depth to oil/air interface  
 $Z_{ao}$  = 20.93 feet Depth to oil/water interface  
 $S_m$  = 0.1042 Water saturation at field capacity  
 $\alpha$  = 0.2301 /foot Van Genuchten mean pore-size parameter  
 $n$  = 2.56783 Van Genuchten pore-size distribution exponent  
 $m$  = 0.610566 Calculated from "n"  
 $dZ$  = 0.01 feet Integration increment (0.01 to 1.0)  
TOC = 637.96 feet Elevation of TOC or measuring point

Oil Specific Volume Calculation Spreadsheet for Soil Samples

Project No. 406  
Boring Designation RW-6

Depth (feet)	dZ (feet)	GRO or DRO (mg/kg)	$\theta_o$ (-)	$V_o$ (ft <sup>3</sup> /ft <sup>2</sup> )
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000
0	0	0	0.0000	0.000

Oil Specific Volume = 0.000

**DO NOT CHANGE ANY CELLS ON THIS WORKSHEET**

Oil Specific Volume Calculation Spreadsheet for Free-phase Hydrocarbon in Monitoring Wells

Project No. 406  
Boring Designation RW-6

**DO NOT CHANGE ANY CELLS ON THIS WORKSHEET**

Z (feet)	$h_{ow}$ (feet)	$h_{ao}$ (feet)	$S_w$ (-)	$S_{of}$ (-)	$\phi S_{of} dZ$ (ft <sup>3</sup> /ft <sup>2</sup> )
Z <sub>u</sub> = 619.48	0.51	0.64	0.9506	0.0000	0.0000
619.47	0.51	0.63	0.9511	0.0010	0.0000
619.46	0.51	0.63	0.9516	0.0019	0.0000
619.45	0.51	0.62	0.9521	0.0028	0.0000
619.44	0.51	0.61	0.9525	0.0037	0.0000
619.43	0.50	0.60	0.9530	0.0046	0.0000
619.42	0.50	0.59	0.9535	0.0055	0.0000
619.41	0.50	0.59	0.9539	0.0063	0.0000
619.40	0.50	0.58	0.9544	0.0071	0.0000
619.39	0.50	0.57	0.9549	0.0079	0.0000
619.38	0.49	0.56	0.9553	0.0087	0.0000
619.37	0.49	0.55	0.9558	0.0095	0.0000
619.36	0.49	0.55	0.9562	0.0102	0.0000
619.35	0.49	0.54	0.9567	0.0110	0.0000
619.34	0.48	0.53	0.9571	0.0117	0.0001
619.33	0.48	0.52	0.9576	0.0123	0.0001
619.32	0.48	0.51	0.9580	0.0130	0.0001
619.31	0.48	0.51	0.9584	0.0137	0.0001
619.30	0.48	0.50	0.9589	0.0143	0.0001
619.29	0.47	0.49	0.9593	0.0149	0.0001
619.28	0.47	0.48	0.9598	0.0155	0.0001
619.27	0.47	0.48	0.9602	0.0160	0.0001
619.26	0.47	0.47	0.9606	0.0166	0.0001
619.25	0.47	0.46	0.9610	0.0171	0.0001
619.24	0.46	0.45	0.9615	0.0176	0.0001
619.23	0.46	0.44	0.9619	0.0181	0.0001
619.22	0.46	0.44	0.9623	0.0185	0.0001
619.21	0.46	0.43	0.9627	0.0190	0.0001
619.20	0.46	0.42	0.9631	0.0194	0.0001
619.19	0.45	0.41	0.9635	0.0198	0.0001
619.18	0.45	0.40	0.9640	0.0202	0.0001
619.17	0.45	0.40	0.9644	0.0205	0.0001
619.16	0.45	0.39	0.9648	0.0209	0.0001
619.15	0.44	0.38	0.9652	0.0212	0.0001
619.14	0.44	0.37	0.9656	0.0215	0.0001
619.13	0.44	0.36	0.9660	0.0218	0.0001
619.12	0.44	0.36	0.9664	0.0220	0.0001
619.11	0.44	0.35	0.9667	0.0223	0.0001
619.10	0.43	0.34	0.9671	0.0225	0.0001
619.09	0.43	0.33	0.9675	0.0227	0.0001
619.08	0.43	0.32	0.9679	0.0229	0.0001
619.07	0.43	0.32	0.9683	0.0231	0.0001
619.06	0.43	0.31	0.9687	0.0232	0.0001
619.05	0.42	0.30	0.9690	0.0234	0.0001
619.04	0.42	0.29	0.9694	0.0235	0.0001
619.03	0.42	0.29	0.9698	0.0236	0.0001
619.02	0.42	0.28	0.9702	0.0237	0.0001
619.01	0.42	0.27	0.9705	0.0238	0.0001
619.00	0.41	0.26	0.9709	0.0238	0.0001
618.99	0.41	0.25	0.9713	0.0239	0.0001
618.98	0.41	0.25	0.9716	0.0239	0.0001
618.97	0.41	0.24	0.9720	0.0239	0.0001
618.96	0.40	0.23	0.9723	0.0239	0.0001
618.95	0.40	0.22	0.9727	0.0238	0.0001
618.94	0.40	0.21	0.9730	0.0238	0.0001
618.93	0.40	0.21	0.9734	0.0237	0.0001
618.92	0.40	0.20	0.9737	0.0237	0.0001
618.91	0.39	0.19	0.9741	0.0236	0.0001
618.90	0.39	0.18	0.9744	0.0235	0.0001
618.89	0.39	0.17	0.9747	0.0234	0.0001
618.88	0.39	0.17	0.9751	0.0233	0.0001
618.87	0.39	0.16	0.9754	0.0231	0.0001
618.86	0.38	0.15	0.9757	0.0230	0.0001
618.85	0.38	0.14	0.9761	0.0228	0.0001
618.84	0.38	0.14	0.9764	0.0226	0.0001
618.83	0.38	0.13	0.9767	0.0225	0.0001
618.82	0.38	0.12	0.9770	0.0223	0.0001
618.81	0.37	0.11	0.9773	0.0221	0.0001

$$Z_u = \rho_{ro} \beta_{ao} H_o / [\rho_{ro} \beta_{ao} - (1 - \rho_{ro}) \beta_{ow}]$$

$$= 619.48 \text{ feet}$$

where:

$$\rho_{ro} = 0.7903$$

$$\beta_{ao} = 2.74$$

$$\beta_{ow} = 3.41$$

$$H_o = 1.64 \text{ feet}$$

$$Z_{ow} = 617.03 \text{ feet}$$

$$Z_{ao} = 618.67 \text{ feet}$$

Other parameters used in calculations (from Data Entry - MWs)

$$S_m = 0.1042$$

$$\alpha = 0.2301 \text{ /foot}$$

$$n = 2.56783$$

$$m = 0.61056612$$

$$dZ = 0.01 \text{ feet} \quad \text{Integration increment (0.01 to 1.0)}$$

$$\phi = 0.437$$

Oil Specific Volume

$$\Sigma \phi S_{of} dZ = 1.0229\text{E-}02 \text{ ft}^3/\text{ft}^2 \quad \text{Oil Specific Volume}$$

618.80	0.37	0.10	0.9777	0.0219	0.0001
618.79	0.37	0.10	0.9780	0.0216	0.0001
618.78	0.37	0.09	0.9783	0.0214	0.0001
618.77	0.37	0.08	0.9786	0.0212	0.0001
618.76	0.36	0.07	0.9789	0.0209	0.0001
618.75	0.36	0.06	0.9792	0.0207	0.0001
618.74	0.36	0.06	0.9795	0.0204	0.0001
618.73	0.36	0.05	0.9798	0.0201	0.0001
618.72	0.35	0.04	0.9801	0.0199	0.0001
618.71	0.35	0.03	0.9804	0.0196	0.0001
618.70	0.35	0.02	0.9807	0.0193	0.0001
618.69	0.35	0.02	0.9810	0.0190	0.0001
618.68	0.35	0.01	0.9812	0.0188	0.0001
618.67	0.34	0.00	0.9815	0.0185	0.0001
618.66	0.34	0.00	0.9818	0.0182	0.0001
618.65	0.34	0.00	0.9821	0.0179	0.0001
618.64	0.34	0.00	0.9824	0.0176	0.0001
618.63	0.34	0.00	0.9826	0.0174	0.0001
618.62	0.33	0.00	0.9829	0.0171	0.0001
618.61	0.33	0.00	0.9832	0.0168	0.0001
618.60	0.33	0.00	0.9834	0.0166	0.0001
618.59	0.33	0.00	0.9837	0.0163	0.0001
618.58	0.33	0.00	0.9840	0.0160	0.0001
618.57	0.32	0.00	0.9842	0.0158	0.0001
618.56	0.32	0.00	0.9845	0.0155	0.0001
618.55	0.32	0.00	0.9847	0.0153	0.0001
618.54	0.32	0.00	0.9850	0.0150	0.0001
618.53	0.31	0.00	0.9852	0.0148	0.0001
618.52	0.31	0.00	0.9855	0.0145	0.0001
618.51	0.31	0.00	0.9857	0.0143	0.0001
618.50	0.31	0.00	0.9860	0.0140	0.0001
618.49	0.31	0.00	0.9862	0.0138	0.0001
618.48	0.30	0.00	0.9864	0.0136	0.0001
618.47	0.30	0.00	0.9867	0.0133	0.0001
618.46	0.30	0.00	0.9869	0.0131	0.0001
618.45	0.30	0.00	0.9871	0.0129	0.0001
618.44	0.30	0.00	0.9873	0.0127	0.0001
618.43	0.29	0.00	0.9876	0.0124	0.0001
618.42	0.29	0.00	0.9878	0.0122	0.0001
618.41	0.29	0.00	0.9880	0.0120	0.0001
618.40	0.29	0.00	0.9882	0.0118	0.0001
618.39	0.29	0.00	0.9884	0.0116	0.0001
618.38	0.28	0.00	0.9887	0.0113	0.0000
618.37	0.28	0.00	0.9889	0.0111	0.0000
618.36	0.28	0.00	0.9891	0.0109	0.0000
618.35	0.28	0.00	0.9893	0.0107	0.0000
618.34	0.27	0.00	0.9895	0.0105	0.0000
618.33	0.27	0.00	0.9897	0.0103	0.0000
618.32	0.27	0.00	0.9899	0.0101	0.0000
618.31	0.27	0.00	0.9901	0.0099	0.0000
618.30	0.27	0.00	0.9903	0.0097	0.0000
618.29	0.26	0.00	0.9905	0.0095	0.0000
618.28	0.26	0.00	0.9907	0.0093	0.0000
618.27	0.26	0.00	0.9909	0.0091	0.0000
618.26	0.26	0.00	0.9910	0.0090	0.0000
618.25	0.26	0.00	0.9912	0.0088	0.0000
618.24	0.25	0.00	0.9914	0.0086	0.0000
618.23	0.25	0.00	0.9916	0.0084	0.0000
618.22	0.25	0.00	0.9918	0.0082	0.0000
618.21	0.25	0.00	0.9919	0.0081	0.0000
618.20	0.25	0.00	0.9921	0.0079	0.0000
618.19	0.24	0.00	0.9923	0.0077	0.0000
618.18	0.24	0.00	0.9924	0.0076	0.0000
618.17	0.24	0.00	0.9926	0.0074	0.0000
618.16	0.24	0.00	0.9928	0.0072	0.0000
618.15	0.24	0.00	0.9929	0.0071	0.0000
618.14	0.23	0.00	0.9931	0.0069	0.0000
618.13	0.23	0.00	0.9932	0.0068	0.0000
618.12	0.23	0.00	0.9934	0.0066	0.0000
618.11	0.23	0.00	0.9936	0.0064	0.0000
618.10	0.22	0.00	0.9937	0.0063	0.0000
618.09	0.22	0.00	0.9939	0.0061	0.0000
618.08	0.22	0.00	0.9940	0.0060	0.0000
618.07	0.22	0.00	0.9941	0.0059	0.0000
618.06	0.22	0.00	0.9943	0.0057	0.0000
618.05	0.21	0.00	0.9944	0.0056	0.0000
618.04	0.21	0.00	0.9946	0.0054	0.0000
618.03	0.21	0.00	0.9947	0.0053	0.0000
618.02	0.21	0.00	0.9948	0.0052	0.0000

618.01	0.21	0.00	0.9950	0.0050	0.0000
618.00	0.20	0.00	0.9951	0.0049	0.0000
617.99	0.20	0.00	0.9952	0.0048	0.0000
617.98	0.20	0.00	0.9954	0.0046	0.0000
617.97	0.20	0.00	0.9955	0.0045	0.0000
617.96	0.20	0.00	0.9956	0.0044	0.0000
617.95	0.19	0.00	0.9957	0.0043	0.0000
617.94	0.19	0.00	0.9958	0.0042	0.0000
617.93	0.19	0.00	0.9959	0.0041	0.0000
617.92	0.19	0.00	0.9961	0.0039	0.0000
617.91	0.18	0.00	0.9962	0.0038	0.0000
617.90	0.18	0.00	0.9963	0.0037	0.0000
617.89	0.18	0.00	0.9964	0.0036	0.0000
617.88	0.18	0.00	0.9965	0.0035	0.0000
617.87	0.18	0.00	0.9966	0.0034	0.0000
617.86	0.17	0.00	0.9967	0.0033	0.0000
617.85	0.17	0.00	0.9968	0.0032	0.0000
617.84	0.17	0.00	0.9969	0.0031	0.0000
617.83	0.17	0.00	0.9970	0.0030	0.0000
617.82	0.17	0.00	0.9971	0.0029	0.0000
617.81	0.16	0.00	0.9972	0.0028	0.0000
617.80	0.16	0.00	0.9973	0.0027	0.0000
617.79	0.16	0.00	0.9974	0.0026	0.0000
617.78	0.16	0.00	0.9975	0.0025	0.0000
617.77	0.16	0.00	0.9975	0.0025	0.0000
617.76	0.15	0.00	0.9976	0.0024	0.0000
617.75	0.15	0.00	0.9977	0.0023	0.0000
617.74	0.15	0.00	0.9978	0.0022	0.0000
617.73	0.15	0.00	0.9979	0.0021	0.0000
617.72	0.14	0.00	0.9979	0.0021	0.0000
617.71	0.14	0.00	0.9980	0.0020	0.0000
617.70	0.14	0.00	0.9981	0.0019	0.0000
617.69	0.14	0.00	0.9982	0.0018	0.0000
617.68	0.14	0.00	0.9982	0.0018	0.0000
617.67	0.13	0.00	0.9983	0.0017	0.0000
617.66	0.13	0.00	0.9984	0.0016	0.0000
617.65	0.13	0.00	0.9984	0.0016	0.0000
617.64	0.13	0.00	0.9985	0.0015	0.0000
617.63	0.13	0.00	0.9986	0.0014	0.0000
617.62	0.12	0.00	0.9986	0.0014	0.0000
617.61	0.12	0.00	0.9987	0.0013	0.0000
617.60	0.12	0.00	0.9987	0.0013	0.0000
617.59	0.12	0.00	0.9988	0.0012	0.0000
617.58	0.12	0.00	0.9988	0.0012	0.0000
617.57	0.11	0.00	0.9989	0.0011	0.0000
617.56	0.11	0.00	0.9990	0.0010	0.0000
617.55	0.11	0.00	0.9990	0.0010	0.0000
617.54	0.11	0.00	0.9991	0.0009	0.0000
617.53	0.11	0.00	0.9991	0.0009	0.0000
617.52	0.10	0.00	0.9991	0.0009	0.0000
617.51	0.10	0.00	0.9992	0.0008	0.0000
617.50	0.10	0.00	0.9992	0.0008	0.0000
617.49	0.10	0.00	0.9993	0.0007	0.0000
617.48	0.09	0.00	0.9993	0.0007	0.0000
617.47	0.09	0.00	0.9993	0.0007	0.0000
617.46	0.09	0.00	0.9994	0.0006	0.0000
617.45	0.09	0.00	0.9994	0.0006	0.0000
617.44	0.09	0.00	0.9995	0.0005	0.0000
617.43	0.08	0.00	0.9995	0.0005	0.0000
617.42	0.08	0.00	0.9995	0.0005	0.0000
617.41	0.08	0.00	0.9996	0.0004	0.0000
617.40	0.08	0.00	0.9996	0.0004	0.0000
617.39	0.08	0.00	0.9996	0.0004	0.0000
617.38	0.07	0.00	0.9996	0.0004	0.0000
617.37	0.07	0.00	0.9997	0.0003	0.0000
617.36	0.07	0.00	0.9997	0.0003	0.0000
617.35	0.07	0.00	0.9997	0.0003	0.0000
617.34	0.07	0.00	0.9997	0.0003	0.0000
617.33	0.06	0.00	0.9998	0.0002	0.0000
617.32	0.06	0.00	0.9998	0.0002	0.0000
617.31	0.06	0.00	0.9998	0.0002	0.0000
617.30	0.06	0.00	0.9998	0.0002	0.0000
617.29	0.05	0.00	0.9998	0.0002	0.0000
617.28	0.05	0.00	0.9998	0.0002	0.0000
617.27	0.05	0.00	0.9999	0.0001	0.0000
617.26	0.05	0.00	0.9999	0.0001	0.0000
617.25	0.05	0.00	0.9999	0.0001	0.0000
617.24	0.04	0.00	0.9999	0.0001	0.0000
617.23	0.04	0.00	0.9999	0.0001	0.0000







Data Entry Worksheet for Soil Samples -- Oil Specific Volume (OSV) Calculations

Project No. = 406  
 Boring Designation = TPH-01R

[ ] = User must enter the soil or fluid parameter, or lab data, as appropriate

Soil Parameters

Fluid Parameters

Oil Parameters

Required to Estimate OSV - Soil

Required to Estimate OSV - Soil

$\rho_b = 1.59 \text{ g/cm}^3$  Bulk density of soil

$\rho_o = 0.7659 \text{ g/cm}^3$  Oil density

Soil Sample Data

[ ] Check for vG parameters

Sample Intervals (maximum 21 samples)

	Feet (bgs)	to	Feet (bgs)	GRO + TPH (mg/kg)	Data Checked
1	17		18	15100	
2	18		19	502	
3	19		20	28.1	
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21	20		21	17.4	

Deepest sample must be entered in this row





Data Entry Worksheet for Soil Samples -- Oil Specific Volume (OSV) Calculations

Project No. = 406  
 Boring Designation = TPH-02R

[ ] = User must enter the soil or fluid parameter, or lab data, as appropriate

Soil Parameters

Fluid Parameters

Oil Parameters

Required to Estimate OSV - Soil

Required to Estimate OSV - Soil

$\rho_b = 1.59 \text{ g/cm}^3$  Bulk density of soil

$\rho_o = 0.7659 \text{ g/cm}^3$  Oil density

Soil Sample Data

[ ] Check for vG parameters

Sample Intervals (maximum 21 samples)

	Feet (bgs)	to	Feet (bgs)	GRO + TPH (mg/kg)	Data Checked
1	19		20	48100	
2	20		21	43300	
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21	21		22	46900	

Deepest sample must be entered in this row





Data Entry Worksheet for Soil Samples -- Oil Specific Volume (OSV) Calculations

Project No. = 406  
 Boring Designation = TPH-03

[ ] = User must enter the soil or fluid parameter, or lab data, as appropriate

Soil Parameters

Fluid Parameters

Oil Parameters

Required to Estimate OSV - Soil

Required to Estimate OSV - Soil

$\rho_b = 1.54 \text{ g/cm}^3$  Bulk density of soil

$\rho_o = 0.7907 \text{ g/cm}^3$  Oil density

Soil Sample Data

[ ] Check for vG parameters

Sample Intervals (maximum 21 samples)

	Feet (bgs)	to	Feet (bgs)	GRO + TPH (mg/kg)	Data Checked
1	12		13	1017	
2	13		14	4910	
3	14		15	6910	
4	15		16	9170	
5	16		17	8320	
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21	17		18	303.1	

Deepest sample must be entered in this row







Data Entry Worksheet for Soil Samples -- Oil Specific Volume (OSV) Calculations

Project No. = 406  
 Boring Designation = TPH-04

[ ] = User must enter the soil or fluid parameter, or lab data, as appropriate

Soil Parameters

Fluid Parameters

Oil Parameters

Required to Estimate OSV - Soil

Required to Estimate OSV - Soil

$\rho_b = 1.64 \text{ g/cm}^3$  Bulk density of soil

$\rho_o = 0.772 \text{ g/cm}^3$  Oil density

Soil Sample Data

[ ] Check for vG parameters

Sample Intervals (maximum 21 samples)

	Feet (bgs)	to	Feet (bgs)	GRO + TPH (mg/kg)	Data Checked
1	16		17	4450	
2	17		18	6920	
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21	18		19	6.8	

Deepest sample must be entered in this row





Data Entry Worksheet for Soil Samples -- Oil Specific Volume (OSV) Calculations

Project No. = 406  
 Boring Designation = TPH-05

= User must enter the soil or fluid parameter, or lab data, as appropriate

Soil Parameters

Fluid Parameters

Oil Parameters

Required to Estimate OSV - Soil

Required to Estimate OSV - Soil

$\rho_b = 1.64 \text{ g/cm}^3$  Bulk density of soil

$\rho_o = 0.772 \text{ g/cm}^3$  Oil density

Soil Sample Data

Check for vG parameters

Sample Intervals (maximum 21 samples)

	Feet (bgs)	to	Feet (bgs)	GRO + TPH (mg/kg)	Data Checked
1	15		16	1290	
2	17		18	270.9	
3	18		19	1012	
4	19		20	3.8	
5	20		21	6.1	
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21	21		22	8070	

Deepest sample must be entered in this row

Oil Specific Volume Calculation Spreadsheet for Soil Samples

Project No. 406  
 Boring Designation TPH-05

Depth (feet)	dZ (feet)	GRO + TPH (mg/kg)	$\theta_o$ (-)	$V_o$ (ft <sup>3</sup> /ft <sup>2</sup> )
15.5	1.5	1290	0.0027	0.004
17.5	1.5	270.9	0.0006	0.001
18.5	1	1012	0.0021	0.002
19.5	1	3.8	0.0000	0.000
20.5	1	6.1	0.0000	0.000
0	0.5	0	0.0000	0.000
0	10.75	0	0.0000	0.000
0	10.75	0	0.0000	0.000
0	10.75	0	0.0000	0.000
0	10.75	0	0.0000	0.000
0	10.75	0	0.0000	0.000
0	10.75	0	0.0000	0.000
0	10.75	0	0.0000	0.000
0	10.75	0	0.0000	0.000
0	10.75	0	0.0000	0.000
0	10.75	0	0.0000	0.000
0	10.75	0	0.0000	0.000
0	10.75	0	0.0000	0.000
0	10.75	0	0.0000	0.000
0	10.75	0	0.0000	0.000
0	10.75	0	0.0000	0.000
0	10.75	0	0.0000	0.000
21.5	1	8070	0.0171	0.017

Oil Specific Volume = 0.024

**DO NOT CHANGE ANY CELLS ON THIS WORKSHEET**





Data Entry Worksheet for Soil Samples -- Oil Specific Volume (OSV) Calculations

Project No. = 406  
 Boring Designation = TPH-06

[ ] = User must enter the soil or fluid parameter, or lab data, as appropriate

Soil Parameters

Fluid Parameters

Oil Parameters

Required to Estimate OSV - Soil

Required to Estimate OSV - Soil

$\rho_b = 1.6 \text{ g/cm}^3$  Bulk density of soil

$\rho_o = 0.7601 \text{ g/cm}^3$  Oil density

Soil Sample Data

[ ] Check for vG parameters

Sample Intervals (maximum 21 samples)

	Feet (bgs)	to	Feet (bgs)	GRO + TPH (mg/kg)	Data Checked
1	15		16	445	
2	17		18	295.9	
3	18		19	6964	
4	19		20	795	
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21	20		21	356	

Deepest sample must be entered in this row

Oil Specific Volume Calculation Spreadsheet for Soil Samples

Project No. 406  
 Boring Designation TPH-06

Depth (feet)	dZ (feet)	GRO + TPH (mg/kg)	$\theta_o$ (-)	$V_o$ (ft <sup>3</sup> /ft <sup>2</sup> )
15.5	1.5	445	0.0009	0.001
17.5	1.5	295.9	0.0006	0.001
18.5	1	6964	0.0147	0.015
19.5	1	795	0.0017	0.002
0	0.5	0	0.0000	0.000
0	10.25	0	0.0000	0.000
0	10.25	0	0.0000	0.000
0	10.25	0	0.0000	0.000
0	10.25	0	0.0000	0.000
0	10.25	0	0.0000	0.000
0	10.25	0	0.0000	0.000
0	10.25	0	0.0000	0.000
0	10.25	0	0.0000	0.000
0	10.25	0	0.0000	0.000
0	10.25	0	0.0000	0.000
0	10.25	0	0.0000	0.000
0	10.25	0	0.0000	0.000
0	10.25	0	0.0000	0.000
0	10.25	0	0.0000	0.000
0	10.25	0	0.0000	0.000
0	10.25	0	0.0000	0.000
0	10.25	0	0.0000	0.000
0	10.25	0	0.0000	0.000
0	10.25	0	0.0000	0.000
20.5	1	356	0.0007	0.001

Oil Specific Volume = 0.019

**DO NOT CHANGE ANY CELLS ON THIS WORKSHEET**



Data Entry Worksheet for Soil Samples -- Oil Specific Volume (OSV) Calculations

Project No. = 406  
 Boring Designation = TPH-07

[ ] = User must enter the soil or fluid parameter, or lab data, as appropriate

Soil Parameters

Fluid Parameters

Oil Parameters

Required to Estimate OSV - Soil

Required to Estimate OSV - Soil

$\rho_b$  = 1.5 g/cm<sup>3</sup> Bulk density of soil

$\rho_o$  = 0.772 g/cm<sup>3</sup> Oil density

Soil Sample Data

[ ] Check for vG parameters

Sample Intervals (maximum 21 samples)

	Feet (bgs)	to	Feet (bgs)	GRO + TPH (mg/kg)	Data Checked
1	18		19	2770	
2	19		20	10700	
3	20		21	26260	
4	21		22	16360	
5	22		23	4803	
6	23		24	9420	
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21	24		25	2978	

Deepest sample must be entered in this row

Oil Specific Volume Calculation Spreadsheet for Soil Samples

Project No. 406  
 Boring Designation TPH-07

Depth (feet)	dZ (feet)	GRO + TPH (mg/kg)	$\theta_o$ (-)	$V_o$ (ft <sup>3</sup> /ft <sup>2</sup> )
18.5	1	2770	0.0054	0.005
19.5	1	10700	0.0208	0.021
20.5	1	26260	0.0510	0.051
21.5	1	16360	0.0318	0.032
22.5	1	4803	0.0093	0.009
23.5	1	9420	0.0183	0.018
0	0.5	0	0.0000	0.000
0	12.25	0	0.0000	0.000
0	12.25	0	0.0000	0.000
0	12.25	0	0.0000	0.000
0	12.25	0	0.0000	0.000
0	12.25	0	0.0000	0.000
0	12.25	0	0.0000	0.000
0	12.25	0	0.0000	0.000
0	12.25	0	0.0000	0.000
0	12.25	0	0.0000	0.000
0	12.25	0	0.0000	0.000
0	12.25	0	0.0000	0.000
0	12.25	0	0.0000	0.000
0	12.25	0	0.0000	0.000
0	12.25	0	0.0000	0.000
24.5	1	2978	0.0058	0.006

Oil Specific Volume = 0.142

**DO NOT CHANGE ANY CELLS ON THIS WORKSHEET**



Data Entry Worksheet for Soil Samples -- Oil Specific Volume (OSV) Calculations

Project No. = 406  
 Boring Designation = TPH-08

[ ] = User must enter the soil or fluid parameter, or lab data, as appropriate

Soil Parameters

Fluid Parameters

Oil Parameters

Required to Estimate OSV - Soil

Required to Estimate OSV - Soil

$\rho_b = 1.59 \text{ g/cm}^3$  Bulk density of soil

$\rho_o = 0.7659 \text{ g/cm}^3$  Oil density

Soil Sample Data

[ ] Check for vG parameters

Sample Intervals (maximum 21 samples)

	Feet (bgs)	to	Feet (bgs)	GRO + TPH (mg/kg)	Data Checked
1	18		19	2777	
2	19		20	96.7	
3	20		21	561	
4	21		22	661	
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21	22		23	7.3	

Deepest sample must be entered in this row







Data Entry Worksheet for Soil Samples -- Oil Specific Volume (OSV) Calculations

Project No. = 406  
 Boring Designation = TPH-09

[ ] = User must enter the soil or fluid parameter, or lab data, as appropriate

Soil Parameters

Fluid Parameters

Oil Parameters

Required to Estimate OSV - Soil

Required to Estimate OSV - Soil

$\rho_b = 1.59 \text{ g/cm}^3$  Bulk density of soil

$\rho_o = 0.7659 \text{ g/cm}^3$  Oil density

Soil Sample Data

[ ] Check for vG parameters

Sample Intervals (maximum 21 samples)

	Feet (bgs)	to	Feet (bgs)	GRO + TPH (mg/kg)	Data Checked
1	17		18	240	
2	18		19	14720	
3	19		20	7410	
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21	20		21	18.2	

Deepest sample must be entered in this row





Data Entry Worksheet for Soil Samples -- Oil Specific Volume (OSV) Calculations

Project No. = 406  
 Boring Designation = TPH-10

[ ] = User must enter the soil or fluid parameter, or lab data, as appropriate

Soil Parameters

Fluid Parameters

Oil Parameters

Required to Estimate OSV - Soil

Required to Estimate OSV - Soil

$\rho_b = 1.59 \text{ g/cm}^3$  Bulk density of soil

$\rho_o = 0.7659 \text{ g/cm}^3$  Oil density

Soil Sample Data

[ ] Check for vG parameters

Sample Intervals (maximum 21 samples)

	Feet (bgs)	to	Feet (bgs)	GRO + TPH (mg/kg)	Data Checked
1	21		22	32.7	
2	22		23	8372	
3	23		24	13760	
4	24		25	610	
5	25		26	84.5	
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21	26		27	27.1	

Deepest sample must be entered in this row



