1R - 408

APPROVALS

YEAR(S):

Price, Wayne

From: Price, Wayne
Sent: Tuesday, March 09, 2004 1:24 PM
To: 'Dan Erskine'; 'Goates, R. Neal'; Price, Wayne; 'gwpope57@aol.com'; Clyde Yancey
Cc: Sheeley, Paul; Johnson, Larry
Subject: RE: Conoco Sims#1 maximum report

OCD hereby approves of the closure work plan. Please send photos when complete.

Please be advised that NMOCD approval of this plan does not relieve (ConocoPhillips) of liability should their operations fail to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD approval does not relieve (ConocoPhillips) of responsibility for compliance with any other federal, state, or local laws and/or regulations.

-----Original Message-----
From: Dan Erskine [mailto:DErskine@maximusa.com]
Sent: Tuesday, March 09, 2004 1:09 PM
To: Dan Erskine; 'Goates, R. Neal'; 'Price, Wayne'; 'gwpope57@aol.com'; Clyde Yancey
Subject: RE: Conoco Sims#1 maximum report

Do you want the attachment this time? <<Breakthrough Curves.pdf>>

-----Original Message-----
From: Dan Erskine
Sent: Tuesday, March 09, 2004 1:07 PM
To: 'Goates, R. Neal'; Price, Wayne; gwpope57@aol.com; Clyde Yancey; Dan Erskine
Subject: RE: Conoco Sims#1 maximum report

Here are the breakthrough curves. My computer died and I had to regenerate them from scratch.

The critical factor in transport in this part of the world is net infiltration (defined in Vadsat as the water that actually makes it to the groundwater table - i.e., recharge). A lot of people argue that there is no recharge occurring in arid southwestern basins where evaporation far exceeds precipitation. Nevertheless, I chose a conservative infiltration rate of 0.5 inches a year to model (Vadsat won't run with 0 infiltration). There is no impact to groundwater using this value. Out of curiosity, I wanted to see what a value might be that carried chloride to groundwater. The second model used exactly the same parameters as the first, except a value of 5 inches per year net infiltration was substituted. This value basically assumes that every drop of rain that falls makes it to groundwater and is completely unrealistic. This model shows that the impact to groundwater, measured 10 meters downgradient of the source entering groundwater, achieves a maximum concentration of nearly 600 mg/L after about 60 years.

Regards,
Dan

-----Original Message-----
From: Goates, R. Neal [mailto:Neal.Goates@conocophillips.com]
Sent: Monday, March 08, 2004 7:18 AM

To: Price, Wayne; gwpope57@aol.com; Clyde Yancey (E-mail); Daniel W. Erskine, Ph.D.
Cc: Goates, R. Neal
Subject: RE: Conoco Sims#1 maximum report

Wayne,
Excavation was done between T samples. The attachment is a hand drawing I found in the file completed by Phillips employee Chris Parks prior to merger of ConocoPhillips. The second excavation was done and depicted by the second subsurface line marking illustrating cross section excavation and readings. That's why the analysis between 2001 and 2002 showed a marked difference in the middle sample area. If I understand correctly all you need now to make a determination is the cl curve. Dan, please provide risk data outputs to Wayne. Thx.

-----Original Message-----
From: Price, Wayne [mailto:WPrice@state.nm.us]
Sent: Friday, March 05, 2004 10:49 AM
To: 'gwpope57@aol.com'; Clyde Yancey (E-mail)
Cc: Goates, R. Neal
Subject: Conoco Sims#1 maximum report

Dear Greg:

Please verify if excavation activities were done between T samples, Also where was the waste material disposed of. Please send me the Cl break thru curves and the input parameters.

Sincerely:

Wayne Price
New Mexico Oil Conservation Division
1220 S. Saint Francis Drive
Santa Fe, NM 87505
505-476-3487
fax: 505-476-3462
E-mail: WPRICE@state.nm.us

Price, Wayne

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fax: 505-476-3462
E-mail: WPRICE@state.nm.us

VADSAT Version 3.0

A Monte Carlo Model for Assessing the Effects of Soil Contamination on Groundwater Quality

Developed by:
Environmental Systems and Technologies Inc.
Blacksburg, Virginia
Tel: 703-552-0685, Fax: 703-951-5307

For
The American Petroleum Institute
1995

PROJECT TITLE: SIMMS 1 WITH 0.5 INCHES INFILTRATION PER YEAR

LOCATION OF RECEPTORS:
1) GROUNDWARER TABLE BELOW INPATED AREA
2) 10 METERS DOWNGRADIENT IN THE DIRECTION OF FLOW

SOURCE AND CHEMICAL DATA

DEPTHM, MEAN THICKNESS OF WASTE ZONE (m)= 1.00000
DEPSTD, STD.DEV. OF THICKNESS OF WASTE ZONE = 0.00000

AREAM, MEAN WASTE ZONE AREA (m^2) =8100.00000
STDA, STD.DEV. OF WASTE ZONE AREA = 0.00000

RLWM, MEAN L/W RATIO (-)= 1.00000
STDRLW, STD.DEV. OF L/W RATIO = 0.00000

CVRTHM, MEAN VALUE OF COVER THICKNESS (m) = 0.00000
CVRTHS, STD.DEV. OF COVER THICKNESS = 0.00000

MEAN MASS FRACTION OF SALT IN WASTE (mg/kg)=1999.99536
STD OF MASS FRACTION OF SALT IN WASTE= 0.00000

CZEROM, MEAN AQU. PHASE CONC OF SALT (g/m^3) =9422.20020
CZEROS, STD.DEV. OF AQU. PHASE CONC. OF SALT = 0.00000
CHEMICAL SPECIES Sodium Chloride

HYDROGEOLOGICAL PROPERTIES

** UNSATURATED ZONE INPUT PARAMETERS **
GAMMAM, MEAN UNSAT ZONE DECAY COEF (1/day)= 0.00000
STDGAM, STD.DEV. OF UNSAT ZONE DECAY COEF = 0.00000

UNFOCM, MEAN UNSAT ZONE ORGANIC CARBON FRACTION (-) = 0.00000
UNFOCS, STD.DEV. OF UNSAT ZONE ORGANIC CARBON FRAC. = 0.00000

FKSW, MEAN SAT. CONDUCTIVITY (m/day)= 0.00500
STDFKS, STD.DEV. OF SAT. CONDUCTIVITY = 0.000

DISTM, MEAN DEPTH TO GROUNDWATER (m)=20.00000
STDDST, STD.DEV. OF DEPTH TO GROUNDWATER= 0.00000

UNPORM, MEAN VADOSE ZONE POROSITY (-) = 0.36000
SUNPOR, STD.DEV. OF VADOSE ZONE POROSITY= 0.00000

PARNM, MEAN VALUE OF VG PARAMETER N (-) = 1.09000
SDPARN, STD.DEV. OF VG PARAMETER N= 0.00000

RESWCM, MEAN RESIDUAL WATER CONTENT (-) = 0.07000
RESWCS, STD.DEV. OF RESIDUAL WATER CONTENT= 0.00000

ALFINM = 0, UNSAT DISPERSIVITY CALCULATED INTERNALLY

** SATURATED ZONE INPUT PARAMETERS **

LAMBW, MEAN SAT. ZONE DECAY COEFF. (1/day) = 0.00000
SLAMB, STD.DEV. OF SAT. ZONE DECAY COEFF.= 0.00000

PORM, MEAN SAT. ZONE POROSITY (-) = 0.30000
STDPOR, STD.DEV. OF SAT. ZONE POROSITY= 0.00000

FOCM, MEAN SAT. ZONE ORG. CARBON FRAC. (-)= 0.00000
STDFOC, STD.DEV. SAT. ZONE ORG. CARBON FRAC.= 0.00000

ALRLTM, MEAN DISPERS, RATIO LONG/TRANSV. (-) = 3.00000
SALRLT, STD.DEV. OF DISP. RATIO LONG/TRANSV. = 0.00000

ALRTVM, MEAN DISPERS. RATIO TRANSV/VERT. (-) =87.00000
SALRTV, STD.DEV. OF DISP. RATIO TRANSV/VERT. = 0.00000

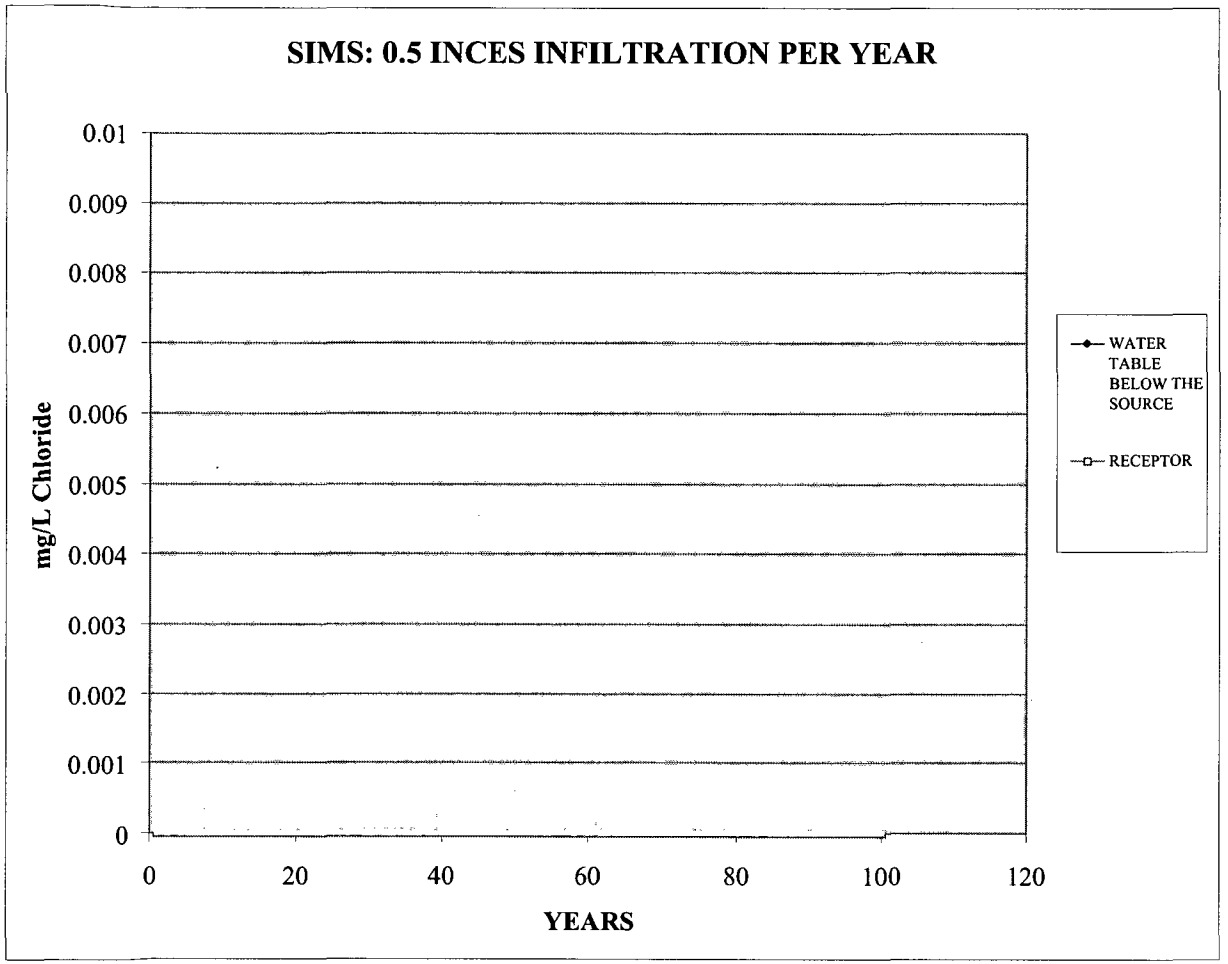
CONDS, SAT. HYDRAULIC COND. (m/day) = 0.86000
SCONDS, STD.DEV. OF SAT HYDRAULIC COND. = 0.00000

GRADS, HYDRAULIC GRADIENT (m/m)= 0.00400
SGRADS, STD.DEV. OF HYDRAULIC GRADIENT = 0.00000

HMEAN, MEAN AQUIFER THICKNESS (m) =21.80000
STDH, STD.DEV. OF AQUIFER THICKNESS = 0.00000

QINM, MEAN INFILTRATION RATE (m/day)= 0.00004
QINSTD, STD.DEV. OF INFILTRATION RATE = 0.00000

TIME (Years)	WATER TABLE BELOW THE SOURCE	RECEPTOR
1	0.00	0.00
2	0.00	0.00
3	0.00	0.00
4	0.00	0.00
5	0.00	0.00
6	0.00	0.00
7	0.00	0.00
8	0.00	0.00
9	0.00	0.00
10	0.00	0.00
11	0.00	0.00
12	0.00	0.00
13	0.00	0.00
14	0.00	[redacted]
15	0.00	[redacted]
16	0.00	0.00
17	0.00	0.00
18	0.00	0.00
19	0.00	0.00
20	0.00	0.00
21	0.00	0.00
22	0.00	0.00
23	0.00	0.00
24	0.00	0.00
25	0.00	0.00
26	0.00	0.00
27	0.00	0.00
28	0.00	0.00
29	0.00	0.00
30	0.00	0.00
31	0.00	0.00
32	0.00	0.00
33	0.00	0.00
34	0.00	0.00
35	0.00	0.00
36	0.00	0.00
37	0.00	0.00
38	0.00	0.00
39	0.00	0.00
40	0.00	0.00
41	0.00	0.00
42	0.00	0.00
43	0.00	0.00
44	0.00	[redacted]
45	0.00	[redacted]
46	0.00	0.00
47	0.00	0.00
48	0.00	0.00
49	0.00	0.00
50	0.00	0.00
51	0.00	0.00
52	0.00	0.00
53	0.00	0.00
54	0.00	0.00
55	0.00	0.00
56	0.00	0.00
57	0.00	0.00
58	0.00	0.00
59	0.00	0.00
60	0.00	0.00
61	0.00	0.00
62	0.00	0.00
63	0.00	0.00
64	0.00	0.00
65	0.00	0.00


SIMS: 0.5 INCES INFILTRATION PER YEAR
mg/L Chloride
0.01
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0
0
20
40
60
80
100
120
YEARS
WATER TABLE BELOW THE SOURCE
RECEPTOR

VADSAT Version 3.0

A Monte Carlo Model for Assessing the Effects of Soil Contamination on Groundwater Quality

Developed by:
Environmental Systems and Technologies Inc.
Blacksburg, Virginia
Tel: 703-552-0685, Fax: 703-951-5307

For
The American Petroleum Institute
1995

PROJECT TITLE: SIMMS 1 WITH 5 INCHES INFILTRATION PER YEAR

LOCATION OF RECEPTORS:
1) GROUNDWARER TABLE BELOW INPATED AREA
2) 10 METERS DOWNGRADIENT IN THE DIRECTION OF FLOW

SOURCE AND CHEMICAL DATA

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STDFOC, STD.DEV. SAT. ZONE ORG. CARBON FRAC.= 0.00000

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SALRLT, STD.DEV. OF DISP. RATIO LONG/TRANSV. = 0.00000

ALRTVM, MEAN DISPERS. RATIO TRANSV/VERT. (-) =87.00000
SALRTV, STD.DEV. OF DISP. RATIO TRANSV/VERT. = 0.00000

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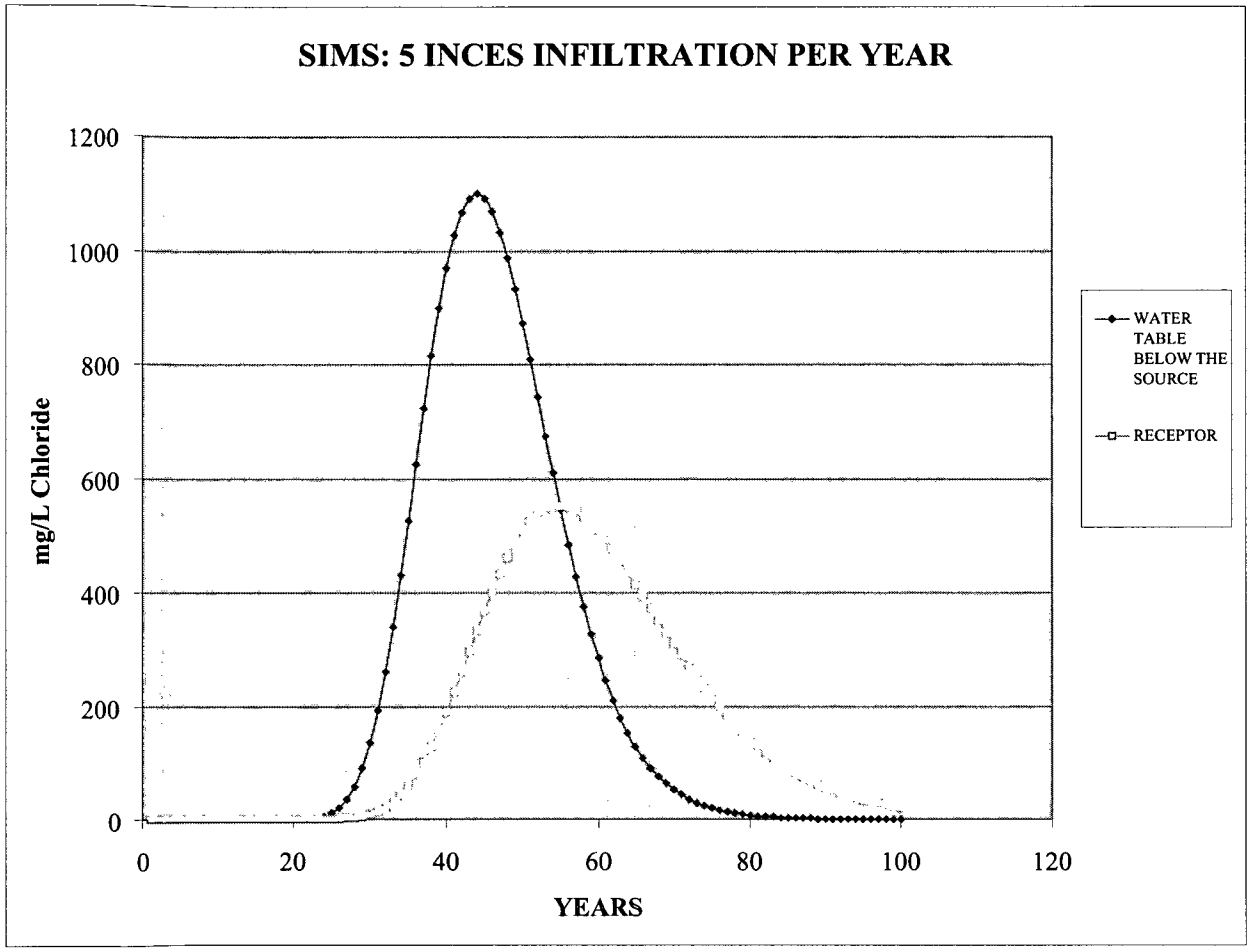
SCONDS, STD.DEV. OF SAT HYDRAULIC COND. = 0.00000

GRADS, HYDRAULIC GRADIENT (m/m)= 0.00400
SGRADS, STD.DEV. OF HYDRAULIC GRADIENT = 0.00000

HMEAN, MEAN AQUIFER THICKNESS (m) =21.80000
STDH, STD.DEV. OF AQUIFER THICKNESS = 0.00000

QINM, MEAN INFILTRATION RATE (m/day)= 0.0004
QINSTD, STD.DEV. OF INFILTRATION RATE = 0.00000

TIME (Years)	WATER TABLE BELOW THE SOURCE	RECEPTOR
1	0	0
2	0	0
3	0	0
4	0	0
5	0	0
6	0	0
7	0	0
8	0	0
9	0	0
10	0	0
11	0	0
12	0	0
13	0	[redacted]
14	0	
15	0	
16	0	0
17	0	0
18	0	0
19	0	0
20	0	0
21	0	0
22	1	0
23	2	0
24	5	0
25	10	0
26	20	1
27	35	1
28	58	3
29	91	5
30	135	8
31	192	13
32	260	21
33	341	30
34	430	43
35	526	59
36	625	79
37	723	102
38	815	128
39	899	158
40	970	190
41	1027	225
42	1068	260
43	1092	[redacted]
44	1100	
45	1092	3
46	1069	402
47	1033	433
48	987	462
49	933	487
50	873	508
51	808	525
52	742	538
53	675	547
54	609	552
55	545	553
56	485	551
57	428	545
58	376	536
59	328	524
60	284	510
61	245	493
62	210	476
63	179	456
64	152	436
65	129	415


SIMS: 5 INCES INFILTRATION PER YEAR
1200
1000
800
600
400
200
0
mg/L Chloride
0
20
40
60
80
100
120
YEARS
WATER TABLE BELOW THE SOURCE
RECEPTOR