WHARF MINE
LEAD, SOUTH DAKOTA
NIRATE/ARSENIC GEOCHEMICAL MIXING CELL MODEL
Area - Trojan Pit

INPUT BLOCK

CHEMICAL	Nitrate	

INFILTRATION	Total Drainage Area:	4,297,070	ft^2
	Unreclaimned Infiltration Rate:	9	in/yr
	Reclaimed Infilgration Rate:	4.5	in/yr

BARREN ROCK	Porewater Concentration:	35.6	ppm
	Moisture at Offload:	0.04	wt %

CELLS	Cell No.	Material	Mass (tons)	Kd (L/kg)	Moisture (wt%)	GW Inflow (tons)	GW Conc. (ppm)
	1	Barren Rock	Time Dependent	0.000	0.04	0	0
	2	Unsaturated Bedrock	33,800,422	0.000	0.01	0	0
	3	Unused	0	0.000	0	0	0
	4	Unused	0	0.000	0	0	0
	5	Unused	0	0.000	0	0	0
	6	Unused	0	0.000	0	0	0
	7	Unused	0	0.000	0	0	0

TIME																					
	Start Time		yrs	0.00	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00
	Time Step		yrs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	End Time		yrs	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00
	Calendar Year		year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016

TIME DEPENDENT DATA																					
	Infiltration Rate		in/yr	9	9	9	9	9	9	9	9	9	9	9	9	9	4.5	4.5	4.5	4.5	4.5
	Chemicals in Infiltration		ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Backfill Added		tons	0	0	0	0	0	466,739	352,621	674,769	4,343,716	11,000,000	6,300,000	3,000,000	0	0	0	0	0	0

CALCULATION BLOCK

CELL 1 - Barren Rock

DATA	VARIABLE		FORMULA	UNITS	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
ROCK	Initial Solids in Cell	A1	C1 from previous year	tons	0	0	0	0	0	0	466,739	819,360	1,494,129	5,837,845	16,837,845	23,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845
	Material Added	B1		tons	0	0	0	0	0	466,739	352,621	674,769	4,343,716	11,000,000	6,300,000	3,000,000	0	0	0	0	0	0
	Total Solids in Cell	C1	A1 + B1	tons	0	0	0	0	0	466,739	819,360	1,494,129	5,837,845	16,837,845	23,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845
WATER	Initial Mass Water in Cell	D1	V1 from previous year	tons	0	0	0	0	0	0	18,670	32,774	59,765	233,514	673,514	925,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514
	Inflow from Infiltration	E1	infiltration rate x area x conversion factor	tons	100,584	100,584	100,584	100,584	100,584	100,584	100,584	100,584	100,584	100,584	100,584	100,584	100,584	50,292	50,292	50,292	50,292	50,292
	Inflow from Groundwater	F1		tons	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	New ore Moisture	G1	B1 x % moisture at offload	tons	0	0	0	0	0	18,670	14,105	26,991	173,749	440,000	252,000	120,000	0	0	0	0	0	0
	Total Water in Cell	H1	D1 + E1 + F1 + G1	tons	100,584	100,584	100,584	100,584	100,584	119,253	133,358	160,349	334,097	774,097	1,026,097	1,146,097	1,146,097	1,095,806	1,095,806	1,095,806	1,095,806	1,095,806
CHEMICALS	Initial Chemicals	I1	Z1 from previous year	tons	0.000	0.000	0.000	0.000	0.000	0.000	0.104	0.149	0.414	4.612	17.642	24.004	25.795	23.531	22.451	21.421	20.437	19.499
	Chemicals from Above	J1	E1 x infiltration chemical concentration	tons	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Chemicals from Groundwater	K1	F1 x groundwater chemical concentration	tons	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Chemicals in New Porewater	L1	G1 x porewater chemical concentration	tons	0.000	0.000	0.000	0.000	0.000	0.665	0.502	0.961	6.185	15.664	8.971	4.272	0.000	0.000	0.000	0.000	0.000	0.000
	Adsorbed Chemicals in Ore	M1	B1 x Q1 x porewater chemical concentration	tons	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Total Chemicals in Liquid	N1	J1 + K1 + L1	tons	0.000	0.000	0.000	0.000	0.000	0.665	0.502	0.961	6.185	15.664	8.971	4.272	0.000	0.000	0.000	0.000	0.000	0.000
	Total Chemicals on Solids	O1	I1 + M1	tons	0.000	0.000	0.000	0.000	0.000	0.000	0.104	0.149	0.414	4.612	17.642	24.004	25.795	23.531	22.451	21.421	20.437	19.499
	Total Chemicals in Cell	P1	O1 + N1	tons	0.000	0.000	0.000	0.000	0.000	0.665	0.606	1.110	6.599	20.276	26.613	28.276	25.795	23.531	22.451	21.421	20.437	19.499
PARTITION CHEMICALS	Kd	Q1		L/kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Adsorbed Chemicals	R1	(Q1 x C1 x P1) / (Q1 x C1 + H1)	tons	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Solid Concentration	S1	R1 / C1 x 10e6	ppm	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Dissolved Chemicals	T1	P1 - R1	tons	0.000	0.000	0.000	0.000	0.000	0.665	0.606	1.110	6.599	20.276	26.613	28.276	25.795	23.531	22.451	21.421	20.437	19.499
	Liquid Concentration	U1	T1 / H1 x 10e6	ppm	0.000	0.000	0.000	0.000	0.000	5.573	4.546	6.921	19.752	26.194	25.936	24.672	22.506	21.474	20.488	19.548	18.651	17.795
OUTFLOW	Water Remaining	V1	C1 x % moisture	tons	0	0	0	0	0	18,670	32,774	59,765	233,514	673,514	925,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514
	Water Out	W1	H1 - V1	tons	100,584	100,584	100,584	100,584	100,584	100,584	100,584	100,584	100,584	100,584	100,584	100,584	100,584	50,292	50,292	50,292	50,292	50,292
	Chemicals Out in Water	X1	W1 x U1 / 10e6	tons	0.000	0.000	0.000	0.000	0.000	0.561	0.457	0.696	1.987	2.635	2.609	2.482	2.264	1.080	1.030	0.983	0.938	0.895
	Chemicals Remaining in Water	Y1	T1 - X1	tons	0.000	0.000	0.000	0.000	0.000	0.104	0.149	0.414	4.612	17.642	24.004	25.795	23.531	22.451	21.421	20.437	19.499	18.605
	Total Chemicals Remaining	Z1	R1 + Y1	tons	0.000	0.000	0.000	0.000	0.000	0.104	0.149	0.414	4.612	17.642	24.004	25.795	23.531	22.451	21.421	20.437	19.499	18.605

CELL 2 - Unsaturated Bedrock

DATA	VARIABLE		FORMULA	UNITS	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
ROCK	Total Solids in Cell	C2		tons	33,800,422	33,800,422	33,800,422	33,800,422	33,800,422	33,800,422	33,800,422	33,800,422	33,800,422	33,800,422	33,800,422	33,800,422	33,800,422	33,800,422	33,800,422	33,800,422	33,800,422	33,800,422
WATER	Initial Mass Water in Cell	D2	V2 from previous year	tons	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004
	Inflow from Cell Above	E2	W1	tons	100,584	100,584	100,584	100,584	100,584	100,584	100,584	100,584	100,584	100,584	100,584	100,584	100,584	50,292	50,292	50,292	50,292	50,292
	Inflow from Groundwater	F2		tons	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total Water in Cell	H2	D2 + E2 + F2	tons	438,588	438,588	438,588	438,588	438,588	438,588	438,588	438,588	438,588	438,588	438,588	438,588	438,588	388,296	388,296	388,296	388,296	388,296
CHEMICALS	Initial Chemicals	I2	Z2 from previous year	tons	0.000	0.000	0.000	0.000	0.000	0.000	0.432	0.685	1.065	2.352	3.843	4.972	5.744	6.171	6.312	6.392	6.419	6.405
	Chemicals from Above	J2	X1	tons	0.000	0.000	0.000	0.000	0.000	0.561	0.457	0.696	1.987	2.635	2.609	2.482	2.264	1.080	1.030	0.983	0.938	0.895
	Chemicals from Groundwater	K2	F2 x groundwater chemical concentration	tons	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Total Chemicals in Cell	P2	I2 + J2 + K2	tons	0.000	0.000	0.000	0.000	0.000	0.561	0.889	1.381	3.051	4.986	6.451	7.453	8.008	7.251	7.343	7.375	7.357	7.299
PARTITION CHEMICALS	Kd	Q2		L/kg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Adsorbed Chemicals	R2	(Q2 x C2 x P2) / (Q2 x C2 + H2)	tons	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Solid Concentration	S2	R2 / C2 x 10e6	ppm	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Dissolved Chemicals	T2	P2 - R2	tons	0.000	0.000	0.000	0.000	0.000	0.561	0.889	1.381	3.051	4.986	6.451	7.453	8.008	7.251	7.343	7.375	7.357	7.299
	Liquid Concentration	U2	T2 / H2 x 10e6	ppm	0.000	0.000	0.000	0.000	0.000	1.278	2.027	3.150	6.957	11.369	14.710	16.994	18.258	18.675	18.910	18.992	18.948	18.799
OUTFLOW	Water Remaining	V2	D2	tons	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004
	Water Out	W2	H2 - V2	tons	100,584	100,584	100,584	100,584	100,584	100,584	100,584	100,584	100,584	100,584	100,584	100,584	100,584	50,292	50,292	50,292	50,292	50,292
	Chemicals Out in Water	X2	W2 x U2 / 10e6	tons	0.000	0.000	0.000	0.000	0.000	0.129	0.204	0.317	0.700	1.144	1.480	1.709	1.837	0.939	0.951	0.955	0.953	0.945
	Chemicals Remaining in Water	Y2	T2 - X2	tons	0.000	0.000	0.000	0.000	0.000	0.432	0.685	1.065	2.352	3.843	4.972	5.744	6.171	6.312	6.392	6.419	6.405	6.354
	Total Chemicals Remaining	Z2	R2 + Y2	tons	0.000	0.000	0.000	0.000	0.000	0.432	0.685	1.065	2.352	3.843	4.972	5.744	6.171	6.312	6.392	6.419	6.405	6.354

18.00	19.00	20.00	21.00	22.00	23.00	24.00	25.00	26.00	27.00	28.00	29.00	30.00	31.00	32.00	33.00	34.00	35.00	36.00	37.00	38.00	39.00	40.00	41.00	42.00	43.00
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
19.00	20.00	21.00	22.00	23.00	24.00	25.00	26.00	27.00	28.00	29.00	30.00	31.00	32.00	33.00	34.00	35.00	36.00	37.00	38.00	39.00	40.00	41.00	42.00	43.00	44.00
2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042

4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845

1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514
50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1,095,806	1,095,806	1,095,806	1,095,806	1,095,806	1,095,806	1,095,806	1,095,806	1,095,806	1,095,806	1,095,806	1,095,806	1,095,806	1,095,806	1,095,806	1,095,806	1,095,806	1,095,806	1,095,806	1,095,806	1,095,806	1,095,806	1,095,806	1,095,806	1,095,806	1,095,806

18.605	17.751	16.936	16.159	15.417	14.710	14.034	13.390	12.776	12.189	11.630	11.096	10.587	10.101	9.638	9.195	8.773	8.371	7.986	7.620	7.270	6.936	6.618	6.314	6.025	5.748
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
18.605	17.751	16.936	16.159	15.417	14.710	14.034	13.390	12.776	12.189	11.630	11.096	10.587	10.101	9.638	9.195	8.773	8.371	7.986	7.620	7.270	6.936	6.618	6.314	6.025	5.748
18.605	17.751	16.936	16.159	15.417	14.710	14.034	13.390	12.776	12.189	11.630	11.096	10.587	10.101	9.638	9.195	8.773	8.371	7.986	7.620	7.270	6.936	6.618	6.314	6.025	5.748

0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
18.605	17.751	16.936	16.159	15.417	14.710	14.034	13.390	12.776	12.189	11.630	11.096	10.587	10.101	9.638	9.195	8.773	8.371	7.986	7.620	7.270	6.936	6.618	6.314	6.025	5.748
16.978	16.199	15.455	14.746	14.069	13.424	12.807	12.220	11.659	11.124	10.613	10.126	9.661	9.218	8.795	8.391	8.006	7.639	7.288	6.954	6.635	6.330	6.040	5.762	5.498	5.246

1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514
50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292
0.854	0.815	0.777	0.742	0.708	0.675	0.644	0.615	0.586	0.559	0.534	0.509	0.486	0.464	0.442	0.422	0.403	0.384	0.367	0.350	0.334	0.318	0.304	0.290	0.276	0.264
17.751	16.936	16.159	15.417	14.710	14.034	13.390	12.776	12.189	11.630	11.096	10.587	10.101	9.638	9.195	8.773	8.371	7.986	7.620	7.270	6.936	6.618	6.314	6.025	5.748	5.484
17.751	16.936	16.159	15.417	14.710	14.034	13.390	12.776	12.189	11.630	11.096	10.587	10.101	9.638	9.195	8.773	8.371	7.986	7.620	7.270	6.936	6.618	6.314	6.025	5.748	5.484

2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
33,800,422	33,800,422	33,800,422	33,800,422	33,800,422	33,800,422	33,800,422	33,800,422	33,800,422	33,800,422	33,800,422	33,800,422	33,800,422	33,800,422	33,800,422	33,800,422	33,800,422	33,800,422	33,800,422	33,800,422	33,800,422	33,800,422	33,800,422	33,800,422	33,800,422	33,800,422

338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004
50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
388,296	388,296	388,296	388,296	388,296	388,296	388,296	388,296	388,296	388,296	388,296	388,296	388,296	388,296	388,296	388,296	388,296	388,296	388,296	388,296	388,296	388,296	388,296	388,296	388,296	388,296

6.354	6.274	6.171	6.048	5.910	5.761	5.602	5.437	5.268	5.096	4.923	4.750	4.578	4.408	4.241	4.077	3.916	3.759	3.607	3.459	3.315	3.176	3.042	2.912	2.787	2.667
0.854	0.815	0.777	0.742	0.708	0.675	0.644	0.615	0.586	0.559	0.534	0.509	0.486	0.464	0.442	0.422	0.403	0.384	0.367	0.350	0.334	0.318	0.304	0.290	0.276	0.264
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7.208	7.089	6.948	6.790	6.618	6.436	6.246	6.052	5.854	5.656	5.457	5.259	5.064	4.872	4.683	4.499	4.319	4.143	3.973	3.808	3.649	3.495	3.346	3.202	3.064	2.931

0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7.208	7.089	6.948	6.790	6.618	6.436	6.246	6.052	5.854	5.656	5.457	5.259	5.064	4.872	4.683	4.499	4.319	4.143	3.973	3.808	3.649	3.495	3.346	3.202	3.064	2.931
18.563	18.257	17.894	17.486	17.044	16.575	16.087	15.586	15.077	14.565	14.053	13.545	13.042	12.546	12.061	11.585	11.122	10.671	10.233	9.808	9.397	9.000	8.616	8.247	7.891	7.548

338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004
50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292
0.934	0.918	0.900	0.879	0.857	0.834	0.809	0.784	0.758	0.733	0.707	0.681	0.656	0.631	0.607	0.583	0.559	0.537	0.515	0.493	0.473	0.453	0.433	0.415	0.397	0.380
6.274	6.171	6.048	5.910	5.761	5.602	5.437	5.268	5.096	4.923	4.750	4.578	4.408	4.241	4.077	3.916	3.759	3.607	3.459	3.315	3.176	3.042	2.912	2.787	2.667	2.551
6.274	6.171	6.048	5.910	5.761	5.602	5.437	5.268	5.096	4.923	4.750	4.578	4.408	4.241	4.077	3.916	3.759	3.607	3.459	3.315	3.176	3.042	2.912	2.787	2.667	2.551

44.00	45.00	46.00	47.00	48.00	49.00	50.00	51.00	52.00	53.00	54.00	55.00	56.00	57.00	58.00	59.00	60.00	61.00
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
45.00	46.00	47.00	48.00	49.00	50.00	51.00	52.00	53.00	54.00	55.00	56.00	57.00	58.00	59.00	60.00	61.00	62.00
2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060

4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060
26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845	26,137,845

1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514
50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1,095,806	1,095,806	1,095,806	1,095,806	1,095,806	1,095,806	1,095,806	1,095,806	1,095,806	1,095,806	1,095,806	1,095,806	1,095,806	1,095,806	1,095,806	1,095,806	1,095,806	1,095,806

5.484	5.233	4.992	4.763	4.545	4.336	4.137	3.947	3.766	3.593	3.428	3.271	3.121	2.978	2.841	2.711	2.586	2.467
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5.484	5.233	4.992	4.763	4.545	4.336	4.137	3.947	3.766	3.593	3.428	3.271	3.121	2.978	2.841	2.711	2.586	2.467
5.484	5.233	4.992	4.763	4.545	4.336	4.137	3.947	3.766	3.593	3.428	3.271	3.121	2.978	2.841	2.711	2.586	2.467

0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5.484	5.233	4.992	4.763	4.545	4.336	4.137	3.947	3.766	3.593	3.428	3.271	3.121	2.978	2.841	2.711	2.586	2.467
5.005	4.775	4.556	4.347	4.147	3.957	3.775	3.602	3.437	3.279	3.129	2.985	2.848	2.717	2.593	2.474	2.360	2.252

1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514	1,045,514
50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292
0.252	0.240	0.229	0.219	0.209	0.199	0.190	0.181	0.173	0.165	0.157	0.150	0.143	0.137	0.130	0.124	0.119	0.113
5.233	4.992	4.763	4.545	4.336	4.137	3.947	3.766	3.593	3.428	3.271	3.121	2.978	2.841	2.711	2.586	2.467	2.354
5.233	4.992	4.763	4.545	4.336	4.137	3.947	3.766	3.593	3.428	3.271	3.121	2.978	2.841	2.711	2.586	2.467	2.354

2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060
33,800,422	33,800,422	33,800,422	33,800,422	33,800,422	33,800,422	33,800,422	33,800,422	33,800,422	33,800,422	33,800,422	33,800,422	33,800,422	33,800,422	33,800,422	33,800,422	33,800,422	33,800,422

338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004
50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
388,296	388,296	388,296	388,296	388,296	388,296	388,296	388,296	388,296	388,296	388,296	388,296	388,296	388,296	388,296	388,296	388,296	388,296

2.551	2.440	2.333	2.230	2.132	2.037	1.947	1.860	1.777	1.697	1.621	1.548	1.478	1.411	1.347	1.286	1.228	1.172
0.252	0.240	0.229	0.219	0.209	0.199	0.190	0.181	0.173	0.165	0.157	0.150	0.143	0.137	0.130	0.124	0.119	0.113
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2.803	2.680	2.562	2.449	2.340	2.236	2.136	2.041	1.949	1.862	1.778	1.698	1.621	1.548	1.478	1.411	1.347	1.286

0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2.803	2.680	2.562	2.449	2.340	2.236	2.136	2.041	1.949	1.862	1.778	1.698	1.621	1.548	1.478	1.411	1.347	1.286
7.219	6.902	6.598	6.307	6.027	5.759	5.502	5.256	5.020	4.795	4.579	4.373	4.175	3.986	3.806	3.633	3.468	3.311

338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004	338,004
50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292	50,292
0.363	0.347	0.332	0.317	0.303	0.290	0.277	0.264	0.252	0.241	0.230	0.220	0.210	0.200	0.191	0.183	0.174	0.167
2.440	2.333	2.230	2.132	2.037	1.947	1.860	1.777	1.697	1.621	1.548	1.478	1.411	1.347	1.286	1.228	1.172	1.119
2.440	2.333	2.230	2.132	2.037	1.947	1.860	1.777	1.697	1.621	1.548	1.478	1.411	1.347	1.286	1.228	1.172	1.119