

Tubbergen 7; Tubbergen Mander 1 & 2; Rossum Weerseloo 2, 3, 5 & 6

Rapportage tbv Wet Milieubeheer vergunning en ontheffing in het kader van het Lozings besluit

Dit rapport is bedoelt om aan de rapportage eisen te voldoen van de Wet Milieubeheer vergunning en ontheffing in het kader van het lozings besluit.

Hoeveelheid afvalstoffen verwerkt per reservoir

| Installatie | Injectieput | 2011 [m3] |
|--------------------|----------------------|----------------|
| Rossum Weerselo 2 | ROSSUM-WEERSELO- 2 | 65.318 |
| | ROSSUM-WEERSELO- 7A | 100.581 |
| Rossum Weerselo 3 | ROSSUM-WEERSELO- 3 | 14.798 |
| | ROSSUM-WEERSELO- 4 | 50.785 |
| Rossum Weerselo 5 | ROSSUM-WEERSELO- 5 | 41.327 |
| Rossum Weerselo 6 | ROSSUM-WEERSELO- 9 | 61.845 |
| Tubbergen 7 | TUBBERGEN- 7 | 58.610 |
| | TUBBERGEN-10 | 94.701 |
| Tubbergen Mander 1 | TUBBERGEN-MANDER- 1 | 46.557 |
| Tubbergen Mander 2 | TUBBERGEN-MANDER- 2 | 9.845 |
| | TUBBERGEN-MANDER- 3C | 26.603 |
| Grand Total | | 570.970 |

* Totale toegestane activiteiten ROW-2 volgens vergunning: 19,1 miljoen m³ produktie water.

* Totale toegestane activiteiten ROW-3 volgens vergunning: 7,8 miljoen m³ produktie water.

* Totale toegestane activiteiten ROW-5 volgens vergunning: 6,59 miljoen m³ produktie water.

* Totale toegestane activiteiten ROW-6 volgens vergunning: 1,61 miljoen m³ produktie water.

* Totale toegestane activiteiten TUB-7 volgens vergunning: 9,8 miljoen m³ produktie water.

* Totale toegestane activiteiten TUM-1 volgens vergunning: 1,57 miljoen m³ produktie water.

* Totale toegestane activiteiten TUM-2 volgens vergunning: 2,2 miljoen m³ produktie water.

Geinjecteerde hoeveelheid chemicalien

| | | Van | Tot | | | |
|------------|--------------------|-------------------------------------|------------------------------|----------------------------|------------------|-------------------------------|
| | | 1-1-2011 | 31-12-2011 | | | |
| Tank | Chemical | Function | remark | Injectiepunt | flowmeter | Liters |
| T-3300 | Cortron UCA 622 | Biocide | batch dosing in V-2001 | V2001 | SCH.330FQISA001 | 1216 |
| T3320/3325 | X8161 | Demulsifier SCH1000 | based on net oil | T1002 | SCH.332FISA001 | 2432 |
| T3320/3325 | X8161 | Demulsifier SCH3100 | based on net oil | T1202 | SCH.332FIA002 | 13940 |
| T-3330 | Cortron CK941-G | Corr. Inhibitor | in suction P-1102A/B | P1102A/B | SCH.333FFICSA001 | was toen nog niet aanwezig |
| T-3350 | K157 | H2S scavenger | liter/kg H2S | V2001 V2005 A2002A/B | SCH.335FFICSA001 | 810 |
| T-3360 | AF340 | Antifoam | based on net oil | V1001 | SCH.336FISA001 | 2261 |
| T-3360 | AF340 | Antifoam | based on net oil | V5001 | SCH.336FIA002 | 694 |
| T-3370 | Cortron CK941-G | Corr. Inhibitor water export | in suction P-1201A/B | P1201A/B | SCH.337FFICSA001 | 16696 |
| T-3380 | OS19 | Oxygen Scavenger water export | in suction P- 1201A/B | P1201A/B | SCH.338FFICSA001 | 8773 |
| T-3390 | Gyptron SA 3440 | Scale inhibitor water export | injection upstream V-1001 | V1001 E1001 P1201 | SCH.339FFICSA001 | 18936 |

Analyse resultaten van geïnjecteerd water

Gedurende het jaar is in het injectiewater een verlaging van de hoeveelheid ionen die van nature in het Schoonebeek formatie water aanwezig zijn geobserveerd. Deze verlaging is het resultaat van de productie van meer gecondenseerde stoom.

Table 1: Wekelijkse analyse resultaten volgens tabel 6 (deel 1)

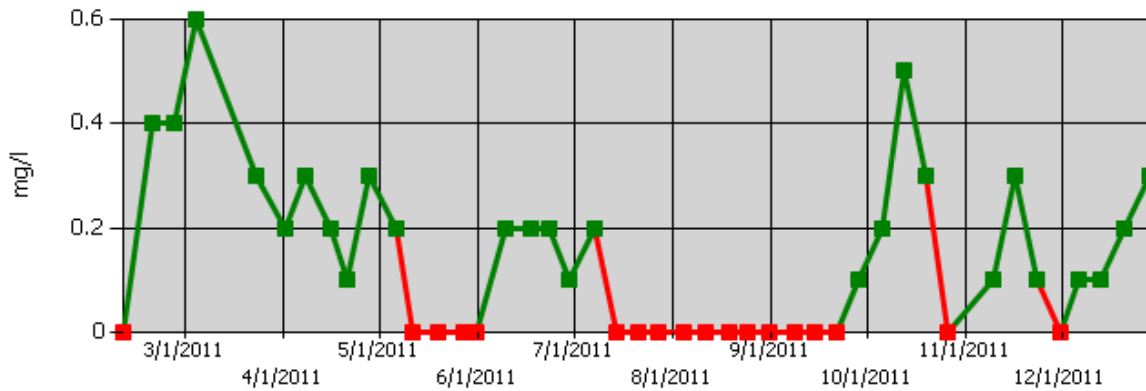
| Sample Date | Sample Number | Sulphide, S ²⁻ (mg/l) | pH | Sulphate, SO ₄ (mg/l) | Sodium chloride, NaCl (calc) (mg/l) | Barium, Ba (mg/l) | Calcium, Ca (mg/l) |
|----------------|-----------------|----------------------------------|-----|----------------------------------|-------------------------------------|-------------------|--------------------|
| 09/02/11 09:30 | SN-2011-2-00130 | <0.1 | 6.5 | <19 | 79129 | 38 | 4700 |
| 18/02/11 15:00 | SN-2011-2-00249 | 0.4 | 6.8 | <25 | 83000 | 38 | 4600 |
| 25/02/11 10:00 | SN-2011-2-00296 | 0.4 | 6.3 | <19 | 81000 | 38 | 4600 |
| 04/03/11 09:45 | SN-2011-3-00075 | 0.6 | 6.5 | <19 | 80000 | 37 | 4600 |
| 11/03/11 09:25 | SN-2011-3-00151 | | 6.1 | <19 | 78000 | 42 | 4500 |
| 23/03/11 10:00 | SN-2011-3-00253 | 0.3 | 5.8 | <19 | 78000 | 43 | 4500 |
| 01/04/11 13:50 | SN-2011-04-0020 | 0.2 | 6.3 | <19 | 81000 | 45 | 4700 |
| 07/04/11 13:40 | SN-2011-04-0087 | 0.3 | 6.4 | <19 | 80000 | 45 | 4600 |
| 15/04/11 09:20 | SN-2011-04-0189 | 0.2 | 6.0 | 120 | 81000 | 35 | 4600 |
| 20/04/11 14:34 | SN-2011-04-0267 | 0.1 | 6.6 | 42 | 83000 | 38 | 4500 |
| 27/04/11 08:45 | SN-2011-04-0339 | 0.3 | 6.3 | <19 | 81000 | 36 | 4100 |
| 06/05/11 11:30 | SN-2011-05-0040 | 0.2 | | <19 | 83000 | 38 | 4500 |
| 11/05/11 10:00 | SN-2011-05-0089 | < 0.1 | 6.3 | <25 | 82000 | 38 | 4100 |
| 19/05/11 12:15 | SN-2011-05-0185 | <0.1 | 6.3 | <25 | 84000 | 43 | 4800 |
| 27/05/11 09:55 | SN-2011-05-0275 | < 0.1 | 6.4 | <25 | 85000 | 43 | 4900 |
| 31/05/11 11:20 | SN-2011-05-0294 | <0.1 | | <25 | 87000 | 45 | 5000 |
| 09/06/11 15:00 | SN-2011-06-0071 | 0.2 | | <25 | 87000 | 45 | 5000 |
| 17/06/11 13:00 | SN-2011-06-0118 | 0.2 | 6.4 | <25 | 85000 | 43 | 4700 |
| 23/06/11 09:45 | SN-2011-06-0165 | 0.2 | 6.6 | <19 | 80000 | 39 | 4300 |
| 29/06/11 14:05 | SN-2011-06-0224 | 0.1 | 6.5 | <19 | 82000 | 40 | 4500 |
| 07/07/11 16:25 | SN-2011-07-0083 | 0.2 | 6.3 | <25 | 85000 | 42 | 4500 |
| 14/07/11 14:00 | SN-2011-07-0134 | <0.1 | 6.5 | <25 | 83000 | 44 | 4500 |
| 21/07/11 09:10 | SN-2011-07-0220 | <0.1 | 6.4 | <19 | 82000 | 41 | 4500 |
| 27/07/11 14:30 | SN-2011-07-0278 | <0.1 | | <25 | 82000 | 43 | 4500 |
| 04/08/11 09:30 | SN-2011-08-0114 | <0.1 | 6.5 | <25 | 82000 | 43 | 4500 |
| 11/08/11 10:00 | SN-2011-08-0190 | <0.1 | 6.4 | <25 | 82000 | 43 | 4500 |
| 18/08/11 11:15 | SN-2011-08-0261 | <0.1 | | <19 | 81000 | 41 | 4400 |
| 24/08/11 14:00 | SN-2011-08-0320 | <0.1 | 6.4 | <19 | 80000 | 39 | 4300 |
| 31/08/11 08:55 | SN-2011-09-0003 | <0.1 | | <19 | 81000 | 43 | 4300 |
| 08/09/11 12:20 | SN-2011-09-0088 | < 0.1 | 6.6 | <19 | 79000 | 41 | 4300 |
| 14/09/11 09:00 | SN-2011-09-0154 | <0.1 | 6.3 | <19 | 79000 | 42 | 4200 |
| 21/09/11 09:40 | SN-2011-09-0232 | <0.1 | 6.4 | <19 | 78000 | 42 | 4200 |
| 28/09/11 12:30 | SN-2011-09-0284 | 0.1 | 6.3 | <19 | 79000 | 46 | 4400 |
| 05/10/11 11:55 | SN-2011-10-0088 | 0.2 | 6.5 | <19 | 73000 | 41 | 4000 |
| 12/10/11 15:15 | SN-2011-10-0162 | 0.5 | 6.5 | <19 | 70000 | 37 | 3900 |
| 19/10/11 13:15 | SN-2011-10-0267 | 0.3 | 6.5 | <19 | 74000 | 44 | 4100 |
| 26/10/11 09:15 | SN-2011-10-0375 | <0.1 | 6.5 | <19 | 75000 | 46 | 4000 |
| 02/11/11 09:55 | SN-2011-11-0019 | | 6.6 | | 77000 | | 4300 |
| 09/11/11 09:10 | SN-2011-11-0116 | 0.1 | 6.5 | <19 | 76000 | 45 | 4100 |
| 16/11/11 14:40 | SN-2011-11-0223 | 0.3 | 6.5 | <19 | 74000 | 48 | 4000 |
| 23/11/11 09:15 | SN-2011-11-0282 | 0.1 | 6.5 | <19 | 75000 | 47 | 4100 |
| 30/11/11 09:15 | SN-2011-11-0386 | <0.1 | 6.4 | <19 | 73000 | 46 | 4000 |
| 06/12/11 09:15 | SN-2011-12-0072 | 0.1 | 6.6 | <19 | 70000 | 37 | 3900 |
| 13/12/11 10:25 | SN-2011-12-0151 | 0.1 | 6.4 | <19 | 71000 | 39 | 3900 |
| 20/12/11 08:50 | SN-2011-12-0236 | 0.2 | 6.3 | <19 | 69000 | 38 | 3800 |
| 28/12/11 12:30 | SN-2011-12-0337 | 0.3 | 6.2 | <19 | 71000 | 36 | 3900 |

Table 2: Wekelijkse analyses volgens tabel 6 (deel 2)

| Sample Date | Sample Number | Magnesium, Mg (mg/l) | Strontium, Sr (mg/l) | Iron (total) (mg/l) | Bicarbonate, HCO ₃ (mg/l) | Carbon dioxide, CO ₂ | Potassium, K (mg/l) | Sodium, Na (mg/l) | Chloride (mg/l) |
|----------------|-----------------|----------------------|----------------------|---------------------|--------------------------------------|---------------------------------|---------------------|-------------------|-----------------|
| 09/02/11 09:30 | SN-2011-2-00130 | 920 | 570 | 30 | 260 | 140 | 880 | 24000 | 48000 |
| 18/02/11 15:00 | SN-2011-2-00249 | 1000 | 600 | 30 | 360 | 230 | 480 | 25000 | 51000 |
| 25/02/11 10:00 | SN-2011-2-00296 | 1000 | 620 | 25 | 570 | 590 | 300 | 24000 | 49000 |
| 04/03/11 09:45 | SN-2011-3-00075 | 990 | 620 | 25 | 340 | 220 | 290 | 23000 | 49000 |
| 11/03/11 09:25 | SN-2011-3-00151 | 1000 | 630 | 20 | 200 | 260 | 250 | 25000 | 47000 |
| 23/03/11 10:00 | SN-2011-3-00253 | 970 | 590 | 25 | 270 | 350 | 260 | 23000 | 47000 |
| 01/04/11 13:50 | SN-2011-04-0020 | 970 | 590 | 30 | 310 | 260 | 290 | 24000 | 49000 |
| 07/04/11 13:40 | SN-2011-04-0087 | 980 | 620 | 20 | 310 | 330 | 240 | 24000 | 48000 |
| 15/04/11 09:20 | SN-2011-04-0189 | 1000 | 590 | 20 | 190 | 310 | 250 | 24000 | 49000 |
| 20/04/11 14:34 | SN-2011-04-0267 | 950 | 600 | 20 | 250 | 100 | 310 | 25000 | 50000 |
| 27/04/11 08:45 | SN-2011-04-0339 | 950 | 570 | 10 | 440 | 230 | 240 | 24000 | 49000 |
| 06/05/11 11:30 | SN-2011-05-0040 | 1000 | 620 | 20 | 230 | 150 | 210 | 24000 | 50000 |
| 11/05/11 10:00 | SN-2011-05-0089 | 1000 | 580 | 20 | 350 | 180 | 210 | 25000 | 50000 |
| 19/05/11 12:15 | SN-2011-05-0185 | 1000 | 630 | 25 | 350 | 230 | 190 | 25000 | 51000 |
| 27/05/11 09:55 | SN-2011-05-0275 | 1100 | 640 | 25 | 350 | 290 | 200 | 25000 | 52000 |
| 31/05/11 11:20 | SN-2011-05-0294 | 1100 | 650 | 15 | 350 | 290 | 200 | 26000 | 53000 |
| 09/06/11 15:00 | SN-2011-06-0071 | 1000 | 650 | 20 | 300 | 200 | 210 | 26000 | 53000 |
| 17/06/11 13:00 | SN-2011-06-0118 | 1100 | 640 | 20 | 300 | 200 | 210 | 26000 | 51000 |
| 23/06/11 09:45 | SN-2011-06-0165 | 980 | 590 | 20 | 290 | 150 | 210 | 24000 | 48000 |
| 29/06/11 14:05 | SN-2011-06-0224 | 1000 | 620 | 20 | 300 | 160 | 200 | 25000 | 50000 |
| 07/07/11 16:25 | SN-2011-07-0083 | 1000 | 620 | 20 | 280 | 230 | 210 | 25000 | 52000 |
| 14/07/11 14:00 | SN-2011-07-0134 | 980 | 620 | 15 | 280 | 230 | 190 | 25000 | 50000 |
| 21/07/11 09:10 | SN-2011-07-0220 | 1000 | 620 | 20 | 520 | 340 | 200 | 25000 | 50000 |
| 27/07/11 14:30 | SN-2011-07-0278 | 1000 | 610 | 15 | 400 | 210 | 190 | 25000 | 50000 |
| 04/08/11 09:30 | SN-2011-08-0114 | 1000 | 630 | 25 | 310 | 260 | 190 | 25000 | 50000 |
| 11/08/11 10:00 | SN-2011-08-0190 | 990 | 610 | 20 | 320 | 260 | 200 | 24000 | 50000 |
| 18/08/11 11:15 | SN-2011-08-0261 | 980 | 600 | 20 | 390 | 260 | 200 | 24000 | 49000 |
| 24/08/11 14:00 | SN-2011-08-0320 | 1000 | 600 | 20 | 300 | 200 | 190 | 24000 | 48000 |
| 31/08/11 08:55 | SN-2011-09-0003 | 970 | 610 | 20 | 270 | 220 | 180 | 24000 | 49000 |
| 08/09/11 12:20 | SN-2011-09-0088 | 950 | 590 | 15 | 310 | 250 | 180 | 23000 | 48000 |
| 14/09/11 09:00 | SN-2011-09-0154 | 930 | 560 | 15 | 300 | 310 | 180 | 24000 | 48000 |
| 21/09/11 09:40 | SN-2011-09-0232 | 910 | 560 | 20 | 270 | 220 | 170 | 23000 | 47000 |
| 28/09/11 12:30 | SN-2011-09-0284 | 910 | 590 | 15 | 364 | 379 | 180 | 24000 | 48000 |
| 05/10/11 11:55 | SN-2011-10-0088 | 850 | 550 | 20 | 473 | 297 | 230 | 22000 | 44000 |
| 12/10/11 15:15 | SN-2011-10-0162 | 820 | 530 | 30 | 499 | 261 | 320 | 21000 | 43000 |
| 19/10/11 13:15 | SN-2011-10-0267 | 850 | 540 | 20 | 489 | 287 | 240 | 22000 | 45000 |
| 26/10/11 09:15 | SN-2011-10-0375 | 860 | 530 | 15 | 524 | 274 | 200 | 23000 | 45000 |
| 02/11/11 09:55 | SN-2011-11-0019 | 860 | 540 | 15 | 508 | 265 | 180 | 23000 | 47000 |
| 09/11/11 09:10 | SN-2011-11-0116 | 860 | 530 | 20 | 517 | 340 | 170 | 23000 | 46000 |
| 16/11/11 14:40 | SN-2011-11-0223 | 820 | 530 | 15 | 510 | 420 | 180 | 22000 | 45000 |
| 23/11/11 09:15 | SN-2011-11-0282 | 850 | 540 | 15 | 340 | 280 | 200 | 23000 | 46000 |
| 30/11/11 09:15 | SN-2011-11-0386 | 840 | 530 | 20 | 370 | 250 | 200 | 22000 | 44000 |
| 06/12/11 09:15 | SN-2011-12-0072 | 820 | 490 | 20 | 330 | 220 | 170 | 21000 | 42000 |
| 13/12/11 10:25 | SN-2011-12-0151 | 850 | 510 | 15 | 380 | 250 | 170 | 22000 | 43000 |
| 20/12/11 08:50 | SN-2011-12-0236 | 840 | 520 | 15 | 350 | 360 | 200 | 22000 | 42000 |
| 28/12/11 12:30 | SN-2011-12-0337 | 850 | 510 | 15 | 260 | 430 | 170 | 21000 | 43000 |

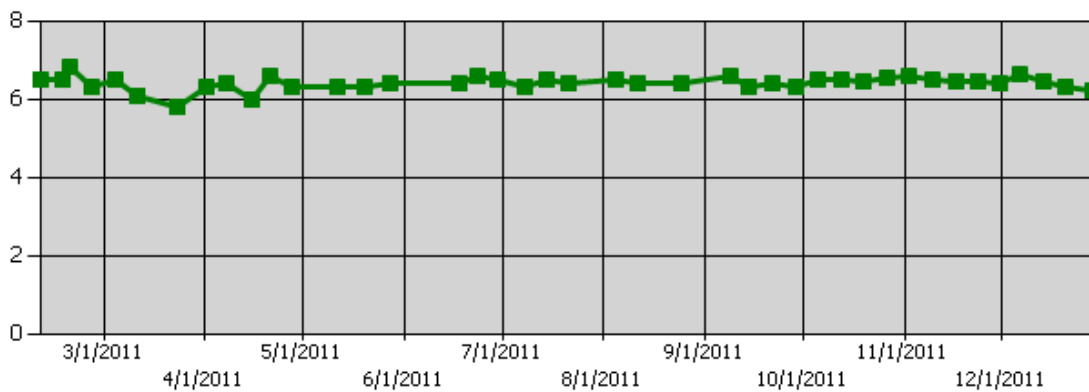
Grafische weergave van de analyse resultaten

Sulphide, S²⁻



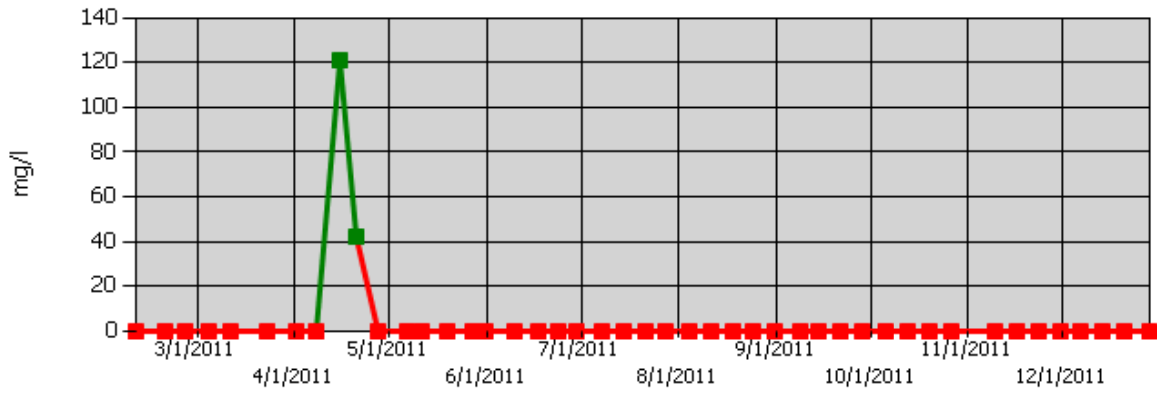
A value of 0 means < result, for the actual result see the table with the Trend Results

pH



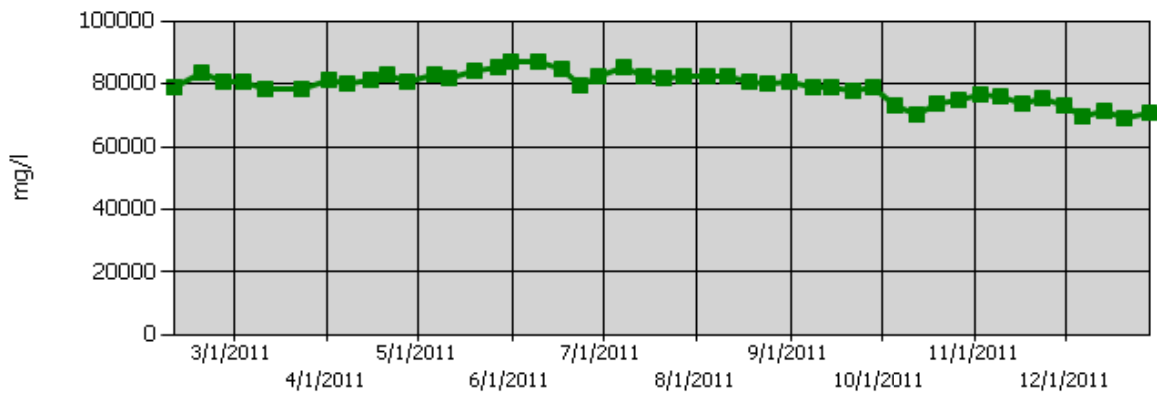
A value of 0 means < result, for the actual result see the table with the Trend Results

Sulphate, SO4



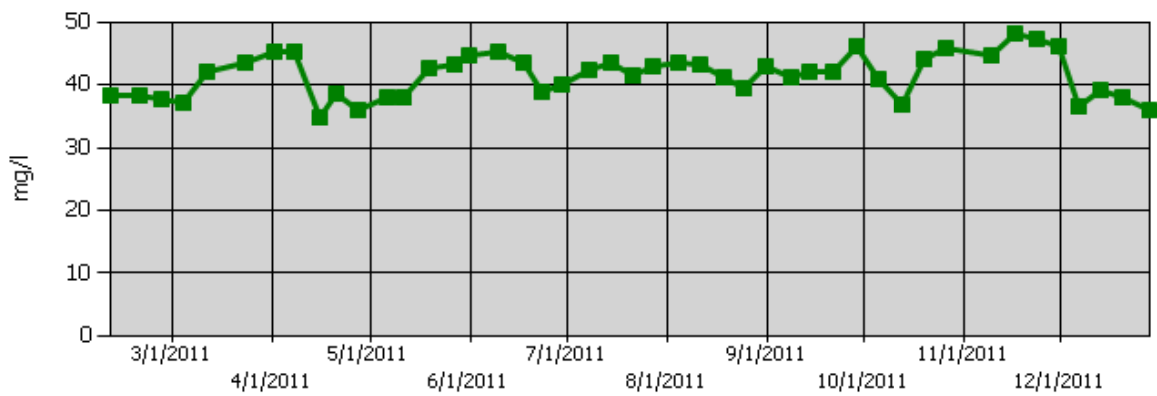
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Sodium chloride, NaCl (calc)



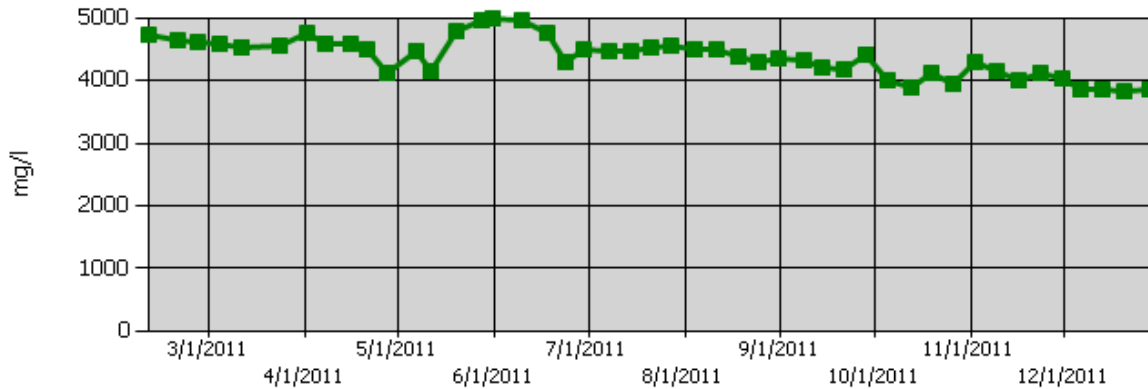
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Barium, Ba



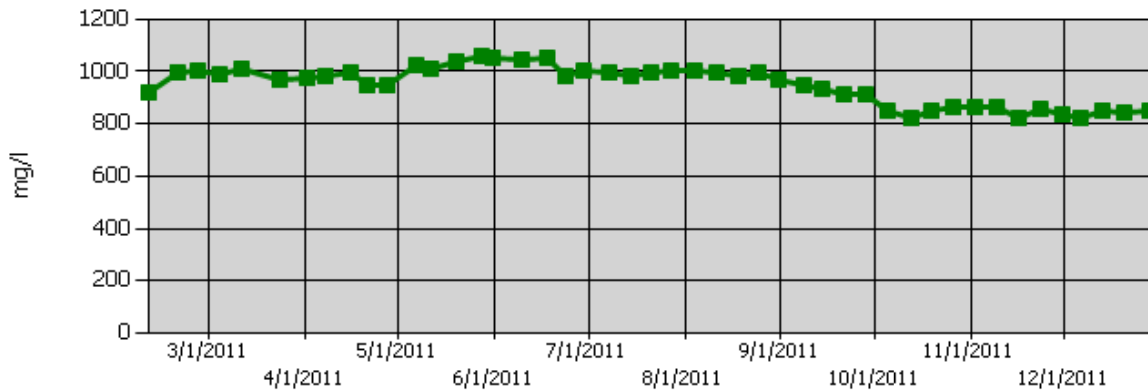
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Calcium, Ca



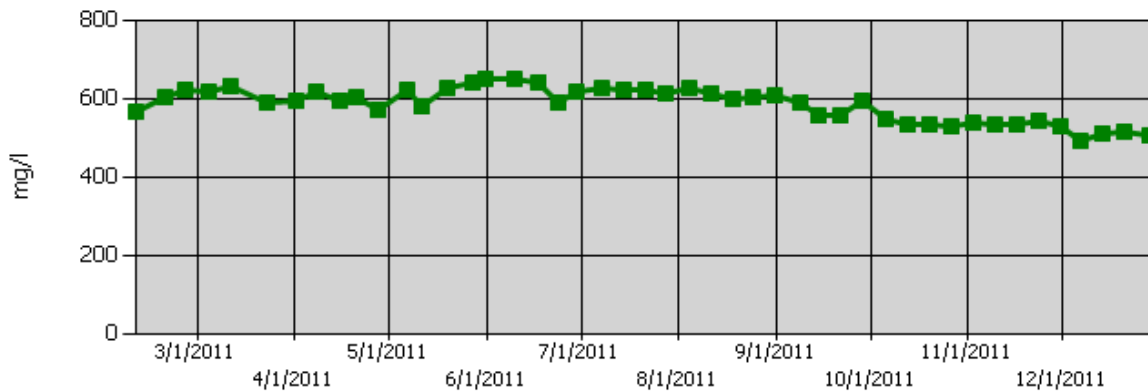
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Magnesium, Mg



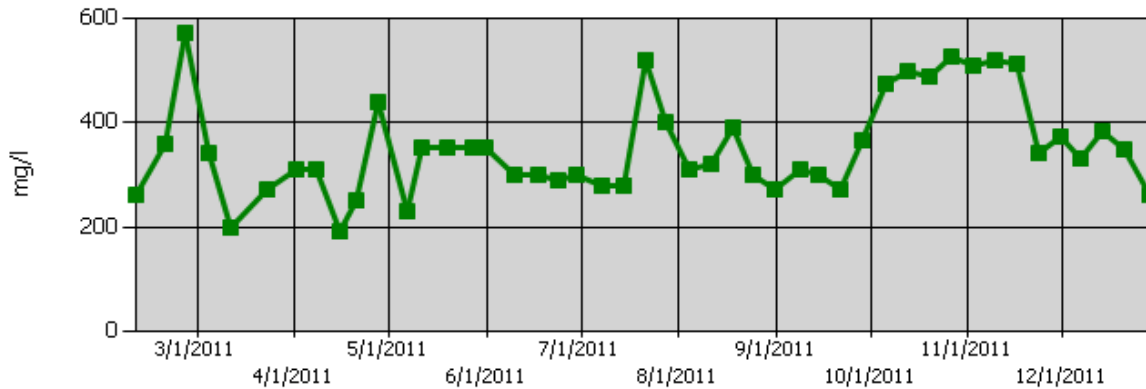
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Strontium, Sr



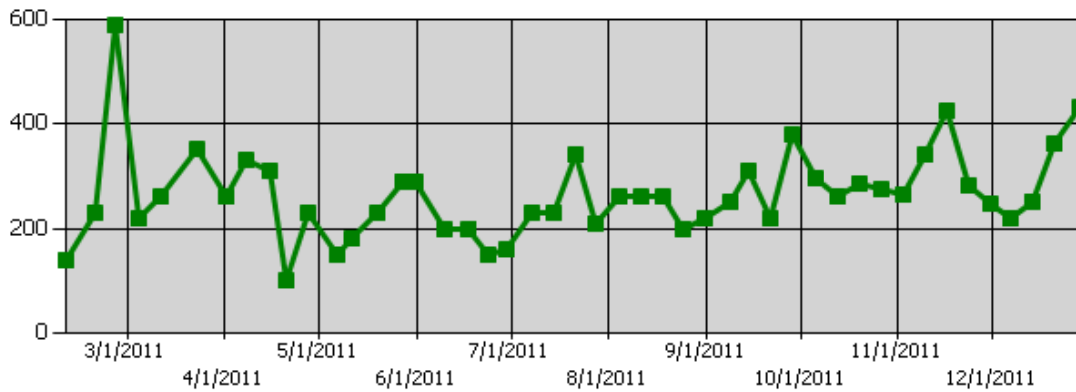
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Bicarbonate, HCO₃



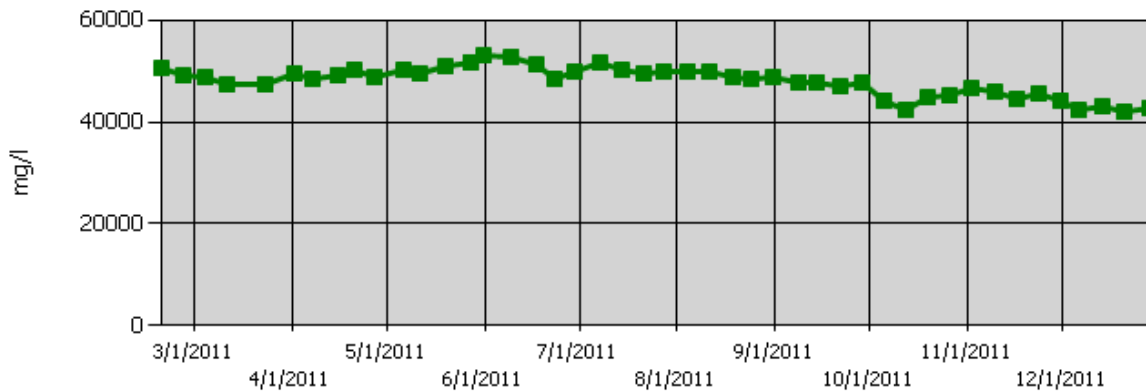
A value of 0 means < result, for the actual result see the table with the Trend Results

Carbon dioxide, CO₂



A value of 0 means < result, for the actual result see the table with the Trend Results

Chloride



A value of 0 means < result, for the actual result see the table with the Trend Results

