#### 14.3 Pumping Test Report for Lots 2 and 4

# REPORT FOR PUMPING TEST. (LOT NO. 2 AND LOT NO. 4) GOVERNORATES SANA'A – TAIZ

# RURAL WATER SUPPLY FOR COMPONET OF THE STUDY FOR WATER RESOURCES MANAGEMENT AND RURAL WATER SUPPLY IMPROVEMENT IN THE REPUBLIC OF YEMEN

### ABDULHALEG M. ALGHOLI



SUBMITTED BY ALI AL-GUNAID

### SEPTEMBER 2006

14-224

PUMBING TEST REPORT SHEET

# **GOVERNORATES OF**

!.

# SANA'A

&

# TAIZ

 $\chi^{2, *}_{i, 2} := \chi$ 

Jarban         S-02         New projected deep well         15         34         42.2         44         0.0         11.1         2.842         2005         450         35.31           Alesh         S-05         Existing projected deep well         15         01         2.842         48         03         01.1         2.842         49         03         11.1         2.845         1933         300         148.08           Al Lejarm         S-05         Existing projected deep well         15         10         41         41         23         2.345         2005         310         148.08           Ball Al Hadrami         S-07         New projected deep well         15         10         41         41         23         42         2336         2005         310         143.14           Ruhm         S-010         Existing projected deep well         15         10         14         14         14         23         2005         310         143.14           Ruhm         S-102         Existing projected deep well         15         11         44         12         24         25         2003         310         134.14           Al Hesn-Al Abyad         S-111         New projected	Samta         Hamidan         So 2         Jachen         Jachen         So 2         Jachen         So 2         Jachen         Jachen         Jachen         So 2         Jachen         Jache	Governorate	District	Site Code	Site Namo	Code Code	Target Water Source	Lalih	Latitude N	Fong	Longilude E	Altitude (m)	Const, Year	Depth.	SWL (G.Lm)	Remarks
Santa's         Hamden         5-02         Jarban         S-02         New projected deep weil         15         N         N         2         N<	Same*         Hamdan         So 02         Jarban         S-02         New projected deep well         15         N 4         13         12         2006         450         345.31           Baid Al Rous         S-05         Attein         S-05         Existing projected deep well         15         14         41         13         12         2006         450         34.31           Sand Al Rous         S-05         Attein         S-05         Faiting projected deep well         15         14         41         41         2.355         2005         410         131.2         2006         410         132.33         200         141.0           Bany Bankord         S-10         Ruhm         S-10         Ruhm         S-10         Ruhm         14         14         14         14         14         14         14         131.2         2006         410         131.2           Bany Bankord         S-10         Ruhm         S-10         Ruhm         S-10         Ruhm         14         14         14         14         14         14         14         14         14         14         14         14         14         14         14         14         14         16						I	-   •		•	"					
Bellad Al Rous         S-05         Risting projected deep well         15         04         312         2.006         1966         300         21257           Samina K Bany Bailooi         S-06         Al Lojian         S-06         Existing projected deep well         15         14         13         312         2.006         1966         300         14103           Samina K Bany Bailooi         S-07         Ruhm         S-05         Existing projected deep well         15         14         14         13         2.31         2005         310         191.63           Samina K Bany Bailooi         S-07         Ruhm         S-05         Existing projected deep well         15         14         14         14         14         12         2.33         200         190         13.1           Al Hean         S-11         Rusing projected deep well         15         15         16         01         13         14 </th <th>Bellad Al Rous         S-05         Ateath         S-05         Existing projected deep well         15         04         71         32.7         2.006         198         30.0         1           Samhan X         S-07         Balt Al Hadrami         S-06         Existing projected deep well         15         14         41         12.35         2.373         2005         410         1           Samhan X         S-07         Banty Bankou         S-08         Ruhm         S-06         Existing projected deep well         15         14         41         73.6         2.373         2005         410         17           Bany Bankou         S-08         Ruhm         S-017         Existing projected deep well         15         10         41         41         2.362         2003         410         17           Al Hesn         S-11         Zwwarg         S-017         Existing projected deep well         15         10         41         2.332         2003         410         17         17         19         230         240         130         16         16         131         13         13         200         410         17         14         12         41         213         200         &lt;</th> <th>Sana'a</th> <th>Hamdan</th> <th>S-02</th> <th></th> <th>S-02</th> <th>New projected deep well</th> <th></th> <th>34 49.2</th> <th></th> <th></th> <th>2,642</th> <th>2005</th> <th>450</th> <th>345.31</th> <th>Constanst discharge &amp; recovery test only</th>	Bellad Al Rous         S-05         Ateath         S-05         Existing projected deep well         15         04         71         32.7         2.006         198         30.0         1           Samhan X         S-07         Balt Al Hadrami         S-06         Existing projected deep well         15         14         41         12.35         2.373         2005         410         1           Samhan X         S-07         Banty Bankou         S-08         Ruhm         S-06         Existing projected deep well         15         14         41         73.6         2.373         2005         410         17           Bany Bankou         S-08         Ruhm         S-017         Existing projected deep well         15         10         41         41         2.362         2003         410         17           Al Hesn         S-11         Zwwarg         S-017         Existing projected deep well         15         10         41         2.332         2003         410         17         17         19         230         240         130         16         16         131         13         13         200         410         17         14         12         41         213         200         <	Sana'a	Hamdan	S-02		S-02	New projected deep well		34 49.2			2,642	2005	450	345.31	Constanst discharge & recovery test only
Santan & Bany Balnot         S.06         Al Lejarm         S-06         Existing projected deep well         15         16         17         2.5         2.73         2005         140         18         16         17         2.5         2.73         2005         140         18         13	Sandari & Bany Balliool         S.06         Al Lelarm         S-06         Exating projected deep well         15         16         41         21         32.7         2,435         1933         300         410         11         215         2,436         1931         2,005         410         11         215         2,745         1050         410         11         215         2,745         2050         410         11         215         2,745         2,935         2003         470         11         217         2,755         2,737         2005         430         11         217         2,755         2,731         2,935         430         310         11         2,755         2,733         2,905         430         431         2,733         2,836         430         41         2,71         2,836         430         44         2,743         2,305         350         350         350         141<		Belad Al Rous	S-05	Afesh	S-05	Existing projected deep well		04 23.5	<u> </u>	13 31.2		1996	ğ	212.97	
Bany Bahlook         5-07         Bail Al Hadrami         S-07         New projected deep well         15         14         44         17         23.5         2.37.4         2005         410         193.22           Au Hesrn         S-08         Ruhm         S-09         New projected deep well         15         11         04.1         41         2         15         2.35         2.03         470         191.85           Au Hesrn         S-10         Tawa'er         S-10/1         Existing projected deep well         15         0         111.4         2         15         2         2         2         2         2         2         141.4         14.1         14         2         14.2         2         14.2         14.1	Bany Bahloot         5-07         Beal / Hadrami         S-07         New projected deep well         15         14         44         17         23.5         2.3.74         2.005         410           Al Hesin         S-09         Ruhm         S-09         New projected deep well         15         01         14         14         14         14         24         28         2.03         470           Al Hesin         S-10         Terwaiar         S-10X1         Exsting projected deep well         15         0         13.1         44         21         24         2.30         299         200         370           Al Hesin         S-11         New projected deep well         15         0         13.3         44         21         2.30         1994         280         300           Jehane         S-14         Risting projected deep well         15         0         13.3         44         21         12.9         2.005         300		e Print Prin	S-06		S-06	Existing projected deep well		16 56.6		21 38.7		_	300	148.09	
	S-06         Ruhm         S-08         New projected deep well         15         11         04.1         44         14         34.0         2.395         2003         470           AI Hestn         S-10         Tewelar         S-101         Existing projected deep well         15         01         18         14         2         18         2         230         1994         280           AI Hestn         S-11         Al Hestn-A Abyad         S-111/1 New projected deep well         15         01         13         47         29         2.30         190         130           Jehana         S-13         Anadh         S-11/1 New projected deep well         15         10         17         21         200         330         130           Jehana         S-13         Anadh         S-14         Existing projected deep well         15         14         27         49         2.30         180         130         126         100         316         140         127         117         1180         126         126         126         205         300         130         126         126         126         126         126         126         126         126         126         126 <td></td> <td>Bany Bahlool</td> <td>S-07</td> <td>Bait Al Hadrami</td> <td>S-07</td> <td>New projected deep well</td> <td></td> <td>14 44.0</td> <td></td> <td>17 23.6</td> <td></td> <td><u> </u></td> <td>410</td> <td>193.22</td> <td></td>		Bany Bahlool	S-07	Bait Al Hadrami	S-07	New projected deep well		14 44.0		17 23.6		<u> </u>	410	193.22	
At Hearn         5-10         Tawa'ar         S-10/1         Existing projected deep well         15         03         14,1         25         12,0         134,74           At Hearn         5-11         At Hearn-At Abyad         5-11/1         New projected deep well         15         01         14         2         14,4         2         14,4         2         200         310         14,4/7           Behana         5-11         At Hearn-At Abyad         5-11/1         New projected deep well         15         11         33         4         27         49         2.300         130         14,4/7           Behana         5-12         Mandah         5-11         New projected deep well         15         01         41         27         49         2.300         130         137.17           Mehna         5-14         At String projected deep well         15         31         44         27         41         217         147.74           Mewha         5-14         At String projected deep well         13         32         44         217         145         73         147.75           Mewha         5-10         At Mewha         5-10         33         32         44	At Hesn         S-10         Texetar         S-10/14         Existing projected deep well         15         03         14         22         220         1994         280           Hesn         S-11         At Hesn-At Abyad         S-10/2         Existing projected deep well         15         01         14         25         16.2         2.230         1994         280           Hehana         S-11         At Hesn-At Abyad         S-11/11         New projected deep well         15         11         33         44         27         49.2         2.300         1900         130           Hehana         S-12         Mandah         S-11         New projected deep well         15         11         44         27         44         2.10         2.000         330           Mehm         S-14         Katsing projected deep well         15         14         21         44         21         41         2117         1985         165         2005         350           Mehm         S-14         Mandyten         T-01         New projected deep well         15         21         22         41         21         22         21         22         23         20         23         20         23			S-09		S-09	New projected deep well		11 04.1		14 34.0			470	191.85	
	Image: Mark Series         S-10/2         Existing projected deep well         15         10         13         3         41         28         54.4         2.255         2004         310           Jehana         S-11         Al Hesn-AI Abyad         S-11/1         New projected deep well         15         11         3.3         44         27         49.8         2.310         2005         350           Nehm         S-14         Al Hesn-AI Abyad         S-11/1         New projected deep well         15         16         17         3.3         44         27         44.9         2.300         1990         180           Nehm         S-14         Al Machen         T-01         New projected deep well         15         30         46         4         27         44         2.315         2005         350           Nehm         S-14         Al Machen         T-01         Nuw projected deep well         13         33         25         41         21         135         201         136         201         231         231         230         136         230         136         230         136         130         231         231         231         231         231         231		A Hesn	S-10	Tawa'ar	S-10/1	Existing projected deep well		03 19.1		29 18.2			280	134.78	
Behana         S-11         New projected deep well         15         11         33.3         44         27         49.2         2.310         2.005         350         152.82           Jehana         S-12         New projected deep well         15         11         43.1         44         27         44.9         2.300         1800         180            S-12         Nehm         S-12         New projected deep well         15         94         27         44         27         44         27         44         27         45         73         55         57.78           Nehm         S-14         Alchail         S-12         New projected deep well         15         39         46.4         42         21         145         73         50         57.78           Nehm         S-14         Alchail         S-14         Existing projected deep well         13         23         56         129         23         50         177         185         139.17           T-02         Bari Al Nuror         T-02         Bir 1 Existing projected deep well         13         23         56         1,27         105         205         107         17.62         17.72         <	Jehana         S-11         Al Hesn-AI Abyad         S-11/1         New projected deep well         15         11         33.3         44         27         49.8         2,310         2005         350           Jehana         S-12         Mahdah         S-14/2         Existing projected deep well         15         11         43.1         44         27         44.9         2,310         2005         350           Nehm         S-14         Altabrian         S-14         Existing projected deep well         15         0         66.7         44         27         44.9         2,315         2005         350           Nehm         S-14         Alking projected deep well         15         0         66.7         44         29         21.4         21.17         1995         145           Nehm         S-14         Nuevyeeb         T-01         New projected deep well         13         22         14         21         12.91         2005         300           Mawiyah         T-022         Bari Al Surcor         T-0214         Bir 1 Alwopiocted deep well         13         22         13         22         13         22         14         21         22         12         12         13			;		S-10/2	Existing projected deep well	ļ .	00 13.5	1	28 54.4	ł		310	144.74	
Jehana         5-14/2         Existing projected deep well         15         11         4.1         2.7         44.9         2.300         180         160            Nehm         5-12         Nahdah         5-12         Naw projected deep well         15         08         06.7         44.2         2.315         2005         350         57.78           Nehm         5-14         Al Ghali         5-14         Existing projected deep well         15         38         46.4         42         29         17         1985         73.06         73.06           Nehm         5-14         Al Maryteeb         T-01         New projected deep well         15         38         46.4         42         29         17         1982         200         139.16           Mawiyah         T-01         Al Maryteeb         T-01         New projected deep well         13         22         51         41         20         201         2316         117.62           Mawiyah         T-022         Bir 3 Existing projected deep well         13         22         55.6         1.209         2001         2316         117.62           Al Maraler         T-03         Sheb Humran         13         23	Jehana         S-11/2         S-41/2         Existing projected deep well         15         11         41         27         44         2         300         1800         180         170         844         42         21         42         21         180         180         180         180         180         180         180         180         180         180         180         180         180         180         170         180         170         180         170         180         180         130         23         25         43         25         120         120         230         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200			5.1	Al Hesn-Al Abuad	S-11/1	New projected deep well		11 33.0					350	152.82	
S-12         Mandah         S-12         Naw projected deep well         15         09         06.7         41         28         16.0         2315         2005         350         57.78           Taiz         S-14         Aldhali         S-14         Existing projected deep well         15         38         46.4         44         29         21.4         2117         1985         73.26           Taiz         T-01         Al wayteeb         T-01         New projected deep well         13         39         32.5         41         13         12.6         12.91         2005         300         139.17           Taiz         T-02         Bani Al Surcor         T-01         New projected deep well         13         22         51.6         43         56         20.7         12.71         1982         200         134.92           Al Ma'aler         T-02         Bani Al Surcor         T-02/4         Bir A New projected deep well         13         23         52.6         43         56         20.7         12.71         134.92         201         134.92           Al Ma'aler         T-03         Bir A New projected deep well         13         23         52.6         43         0         10	Faiz         S-12         Mandah         S-12         New fragecied deep well         15         09         06.7         44         2315         2005         350         350           Taiz         S-14         Aldhali         S-14         Existing projected deep well         15         38         46.4         47         29         21.4         2.117         1985         146           Taiz         Toil         Almayteb         Toil         Almayteb         Toil         New projected deep well         13         33         35.6         43         13         126         1291         2005         300           Mawyach         Tool         Almayteeb         Tool         New projected deep well         13         23         55.6         43         13         126         1291         2005         230         250         400         271         1326         1992         2001         251         257         2005         300         250         400         271         251         2005         2005         250         400         271         272         2005         400         272         2005         400         272         2102         400         1308         252         1257 </td <td>-</td> <td>Jehana</td> <td>;</td> <td></td> <td>S-44/2</td> <td>Existing projected deep w</td> <td>15</td> <td>11 43.1</td> <td><u> </u></td> <td>27 44.9</td> <td>1</td> <td><u></u></td> <td>180</td> <td></td> <td>Canceled (test equipments can not be setted)</td>	-	Jehana	;		S-44/2	Existing projected deep w	15	11 43.1	<u> </u>	27 44.9	1	<u></u>	180		Canceled (test equipments can not be setted)
Nehrn         S-14         Existing projected deep well         15         38         46. 4         2         117         1985         185         73 26           Talz         Mawiyah         T-01         Alwayteeb         T-01         New projected deep well         13         39         32. 5         44         13         12.6         1.271         1982         73 26           Talz         T-02         Bani Al Suror         T-01         New projected deep well         13         22         51. 9         43         56         0.7         1.271         1982         233 0         183 08           T-02         Bani Al Suror         T-02/ 1         Bir 1 Existing projected deep well         13         22         55. 43         56         25. 6         1.209         2001         231 16           A Ma'aler         T-02         Bani Al Suror         T-02/ 14         Bir 4 New projected deep well         13         21         55         25. 6         1.209         2001         231 17         23         24. 2         1.257         2005         400         22.22           A Ma'aler         T-04         Yatog Bani Hamad         T-03         Al Maestan(4) Existing proj deep well         13         21         24 <th< td=""><td>Nehr         S-14         Kisting projected deep well         15         38         46.4         44         29         21.4         21.17         1985         185           Talz         Mawiyah         T-01         Alwayteeb         T-01         New projected deep well         13         33         32.5         44         13         12.6         1,271         1982         305           Talz         T-02         Bani Al Suror         T-02         Bani Al Suror         T-023         Bir 1 Existing projected deep well         13         22         51.9         43         56         0.07         1,271         1982         230           A Marater         T-02         Bani Al Suror         T-024         Bir 1 Anarytojected deep well         13         23         55.2         43         56         12.09         2001         231           A Marater         T-03         Bani Al Suror         T-024         Bir 1 Anar(1) New projected deep well         13         23         55.2         43         56         400         771         1982         2005         400           A Marater         T-04         Yatog Bani Humran         T-03         Zatog Bani Al Now projected deep well         13         21         44</td><td></td><td></td><td>S-12</td><td>Mahdah</td><td>S-12</td><td>New projected deep well</td><td></td><td>00 00.1</td><td></td><td>28 16.0</td><td></td><td><u> </u></td><td><b>_</b></td><td>57.78</td><td></td></th<>	Nehr         S-14         Kisting projected deep well         15         38         46.4         44         29         21.4         21.17         1985         185           Talz         Mawiyah         T-01         Alwayteeb         T-01         New projected deep well         13         33         32.5         44         13         12.6         1,271         1982         305           Talz         T-02         Bani Al Suror         T-02         Bani Al Suror         T-023         Bir 1 Existing projected deep well         13         22         51.9         43         56         0.07         1,271         1982         230           A Marater         T-02         Bani Al Suror         T-024         Bir 1 Anarytojected deep well         13         23         55.2         43         56         12.09         2001         231           A Marater         T-03         Bani Al Suror         T-024         Bir 1 Anar(1) New projected deep well         13         23         55.2         43         56         400         771         1982         2005         400           A Marater         T-04         Yatog Bani Humran         T-03         Zatog Bani Al Now projected deep well         13         21         44			S-12	Mahdah	S-12	New projected deep well		00 00.1		28 16.0		<u> </u>	<b>_</b>	57.78	
Talz         Mawiyah         T.01         Alwayteeb         T.01         New projected deep well         13         35         44         13         12.6         1.291         2005         300         133.9.13           1         1.02         Bani Al Suror         T.02/3         Bir 1 Existing projected deep well         13         22         51.9         43         56         0.0.7         1,271         1982         230         183.88           Al Ma'afer         T-02/3         Bir 3 Existing projected deep well         13         23         52.6         43         56         20.7         1.271         1982         230         183.88           Al Ma'afer         T-02/3         Bir 3 Existing projected deep well         13         23         52.6         43         56         20.7         1.276         1998         190         134.92           Al Ma'afer         T-03         Sheb Humran         T-03/1         Al Meshaar(4) Existing proj deep well         13         21         52.6         1.291         201         134.92         21.252         24.19         24.10         27.26         134.93         26.13         24.19         24.10         27.26         134.93         26.13         24.10         24.10         27.41	Taiz         Mewiyah         T-01         Al Muayteeb         T-01         New projected deep well         13         39         32.5         44         13         12.6         1.291         2005         300         301		Nehm	S-14		<u>ዓ</u> ተል	Existing projected deep well	15	38 46 4		29 21 4		{—		73 28	Canceled (well collapsed, dirty water)
T-02/1         Bir 1         Existing projected deep well         13         22         51.9         43         56         0.0.7         1.271         1982         230         183.88           Al Ma'afer         T-02/3         Bir 3         Existing projected deep well         13         23         55.6         1.209         2001         251         117.62           Al Ma'afer         T-02/3         Bir 3         Existing projected deep well         13         21         52.2         43         56         24.2         1.207         2005         400         24.4.92           Al Ma'afer         T-03         Al Jah (1) New projected deep well         13         21         52.2         43         56         24.2         1.207         2005         400         22.22           Al Mawaset         T-04         Yafog Bani Hamad         T-04         Existing projected deep well         13         21         64.6         41         07         7.366         1992         260         24.19           Al Mawaset         T-04         Yafog Pani Hamad         T-04         Existing projected deep well         13         21         64.6         41         01         07         1.24.10         2201         24.10         24.13 <td>Harafer         T-02         Bani Al Suror         T-02/1         Bir 1         Existing projected deep well         13         22         51.9         43         58         00.7         1,271         1982         230           Al Ma'afer         T-02         Bani Al Suror         T-02/3         Bir 3         Existing projected deep well         13         21         52.6         43         58         26.1         1,209         2001         251           Al Ma'afer         T-03         Bir 4         New projected deep well         13         21         52.6         43         58         26.1         1209         2001         251           Al Ma'afer         T-03         Al Jah (1) New projected deep well         13         20         50.1         44         01         07.0         1,366         1998         260           Al Mawaset         T-04         Yatog Bani Hamad         T-04         Risting projected deep well         13         21         846.5         44         01         07.0         1,366         1980         260           Al Mawaset         T-04         Yatog Bani Hamad         T-04         Risting projected deep well         13         13         24.6         47         01         07</td> <td>Taiz</td> <td>Mawiyah</td> <td>10 1</td> <td></td> <td>1-0-1</td> <td>New projected deep well</td> <td>₽ ₽</td> <td>39 32.0</td> <td></td> <td>13 12.6</td> <td></td> <td><u> </u></td> <td><b> </b></td> <td>139.17</td> <td>Step test only. High temperature water ( 60°C)</td>	Harafer         T-02         Bani Al Suror         T-02/1         Bir 1         Existing projected deep well         13         22         51.9         43         58         00.7         1,271         1982         230           Al Ma'afer         T-02         Bani Al Suror         T-02/3         Bir 3         Existing projected deep well         13         21         52.6         43         58         26.1         1,209         2001         251           Al Ma'afer         T-03         Bir 4         New projected deep well         13         21         52.6         43         58         26.1         1209         2001         251           Al Ma'afer         T-03         Al Jah (1) New projected deep well         13         20         50.1         44         01         07.0         1,366         1998         260           Al Mawaset         T-04         Yatog Bani Hamad         T-04         Risting projected deep well         13         21         846.5         44         01         07.0         1,366         1980         260           Al Mawaset         T-04         Yatog Bani Hamad         T-04         Risting projected deep well         13         13         24.6         47         01         07	Taiz	Mawiyah	10 1		1-0-1	New projected deep well	₽ ₽	39 32.0		13 12.6		<u> </u>	<b> </b>	139.17	Step test only. High temperature water ( 60°C)
Integrated         Integra	Indicated         T-02         Bir A Nucror         T-02/4         Bir A New projected deep well         13         21         52.6         43         58         56         1.209         2001         251           Al Marafer         T-03         Bir A New projected deep well         13         21         52.2         43         58         24.2         1.226         1998         190           Al Marafer         T-03         Bir A New projected deep well         13         20         50.1         44         01         07.0         1.366         1998         260           Al Mawaset         T-04         Yatong Bani Hamad         T-03/4         Al Meashaar(4) Existing proj.deep well         13         20         50.1         44         01         07.0         1.366         1998         260           Al Mawaset         T-04         Yatong Bani Hamad         T-04         Existing proj.deep well         13         13         34.5         44         01         07.0         1.367         1308         260           Al Mawaset         T-06         Mardera Alhomary(1) Existing proj.deep well         13         13         34.5         44         02         17.8         13067         160           Al Wazieyah			<b></b>		T-02/1		1.1	5		58 00.7			_	183.88	
T-03         T-02/4         Bir 4 New projected deep well         13         21         52.2         43         58         24.2         1.226         1998         180         134.92           T-03         T-03/1         Al Jah (1) New projected deep well         13         20         50.1         44         02         55.2         1,257         2005         400         22.22           T-03         T-03/4         Al Meashaar(4) Existing proj-deep well         13         23         54.8         44         01         07.0         1,366         1998         260         24.19           T-04         Yafoq Bani Hamad         T-04         Existing proj-deep well         13         13         23         54.8         44         01         07.0         1,361         1982         220         124.10           Ren         T-05/1         Mardara Alhomary(1) Existing proj.deep well         13         13         34.5         44         02         17.8         1307         1985         120         124.10           Ren         T-05/1         Wadi Rasan (3) Existing proj.deep well         13         12         44         02         17.8         1307         1985         120         124.10           Fooo	T-03         T-02/4         Bir 4 New projected deep well         13         21         52.2         43         58         24.2         1.226         1998         190           T-03         T-03/1         AI Jah (1) New projected deep well         13         20         50.1         44         02         55.2         1,257         2005         400           et         T-03         AI Meashaar(4) Existing projected deep well         13         23         54.8         44         01         07.0         1,366         1998         260           valen         T-04         Existing projected deep well         13         23         54.8         44         01         07.0         1,366         1998         260           valen         T-05/1         Ai Meashaar(4) Existing proj deep well         13         13         34.5         44         02         17.8         1,301         1982         220           valen         T-05/1         Marda'a Alhomary(1) Existing proj deep well         13         13         34.5         44         02         17.8         1,301         1982         120           valen         T-05/1         Wadi Masan (3) Existing proj deep well         13         12         44.0         02			T-02	Bani Al Suror	T-02/3	Bir 3 Existing projected deep well	13	23 52.(		58 25.6			İ	117.62	
T-03         Sheb Humran         T-03/1         Al Jah (1) New projected deep well         13         20         50.1         44         02         55.2         1,257         2005         400         22.22           T-04         Yatoq Bani Hamad         T-03/4         Al Meashaar(4) Existing proj.deep well         13         23         54.8         44         01         07.0         1,366         1998         260         24.19           T-04         Yatoq Bani Hamad         T-04         Existing projected deep well         13         18         46.5         44         01         07.0         1,366         129.8         260         24.19           en         T-05         Maidata Alhomary(1) Existing proj.deep well         13         13         34.5         44         02         17.8         1,307         1985         120         82.0         Rep           f         T-06         Wadi Masan (3) Existing proj.deep well         13         12         44.0         02         17.8         1,307         160         27.0         82.0         Rep           f         T-06         Ai Adai Masan (3) Existing proj.deep well         13         12         44.0         02         17.6         17.0         17.0         17.0 <td>T-03         Sheb Humran         T-03/1         Al Jah (1) New projected deep well         13         20         50.1         44         02         55.2         1,257         2005         400           et         T-04         Yatoq Bani Hamad         T-03/4         Al Meashaar(4) Existing proj.deep well         13         23         54.8         44         01         07.0         1,366         1998         260           et         T-04         Existing projected deep well         13         18         46.5         44         01         07.0         1,366         1998         260           valen         T-05         Handata Alhomary(1) Existing proj.deep well         13         14         02         17.8         1,381         1982         220           valen         T-05         Wadi Masan (3) Existing proj.deep well         13         12         44         02         17.8         1,307         1985         120           ah         T-06         Nadi Masan (3) Existing proj.deep well         13         12         44         02         17.8         1,307         1985         160           ah         T-06         Nadi Masan (3) Existing proj.deep well         13         12         44         02         1</td> <td></td> <td>Ai Ma'afer</td> <td></td> <td></td> <td>T-02/4</td> <td>Bir 4 New projected deep well</td> <td>13</td> <td></td> <td>i T</td> <td>58 24.2</td> <td>[</td> <td><u> </u></td> <td>ļ</td> <td>134.92</td> <td></td>	T-03         Sheb Humran         T-03/1         Al Jah (1) New projected deep well         13         20         50.1         44         02         55.2         1,257         2005         400           et         T-04         Yatoq Bani Hamad         T-03/4         Al Meashaar(4) Existing proj.deep well         13         23         54.8         44         01         07.0         1,366         1998         260           et         T-04         Existing projected deep well         13         18         46.5         44         01         07.0         1,366         1998         260           valen         T-05         Handata Alhomary(1) Existing proj.deep well         13         14         02         17.8         1,381         1982         220           valen         T-05         Wadi Masan (3) Existing proj.deep well         13         12         44         02         17.8         1,307         1985         120           ah         T-06         Nadi Masan (3) Existing proj.deep well         13         12         44         02         17.8         1,307         1985         160           ah         T-06         Nadi Masan (3) Existing proj.deep well         13         12         44         02         1		Ai Ma'afer			T-02/4	Bir 4 New projected deep well	13		i T	58 24.2	[	<u> </u>	ļ	134.92	
T-04         T-03/4         Al Meashaar(4) Existing proj.deep well         13         23         54.8         44         01         07.0         1,366         1998         260         24.19         1           T-04         Yatoq Bani Hamad         T-04         Existing projected deep well         13         18         46.5         44         05         46.8         1,381         1982         220         124.10         1           en         T-05         Al Azaez         T-05/1         Marda'a Alhomary(1) Existing proj.deep well         13         13         34.5         44         02         17.8         1307         1985         120         8.20         Rep           en         T-05         Al Azaez         T-06/13         Wadi Masan (3) Existing proj.deep well         13         12         44         02         17.6         1307         160          Can           1<0	ef         T-04         AI Meashaar(4) Existing proj.deep well         13         23         54.8         44         01         07.0         1,366         1998         260           ef         T-04         Yatoq Bani Hamad         T-04         Existing projected deep well         13         13         14         05         46.8         1,381         1982         220           yaten         T-05         AI Azaez         T-05/1         Marda'a Alhomary(1) Existing proj.deep well         13         13         34.5         44         02         17.8         1305         120           yaten         T-05         AI Azaez         T-06/13         Wadi Masan (3) Existing proj.deep well         13         12         44.0         02         17.8         1,377         1967         160           ah         T-06         New projected deep well         13         12         44.0         44         02         13667         160           ah         T-06         New projected deep well         13         12         44.0         45         03.9         539         2004         200			T-03		T-03/1	Al Jah (1) New projected	13							22.22	
T-04         T-04         Existing projected deep well         13         18         46.5         44         05         46.8         7,381         1982         220         124.10           en         T-05         T-05/1         Mardata Alhomary(1) Existing proj deep well         13         13         34.5         44         02         17.8         1,377         1985         120         8.20           en         T-05         A Azaez         T-05/1         Mardata Alhomary(1) Existing proj deep well         13         13         34.5         44         02         17.8         1,305         160         8.20           T-05         A Existing proj deep well         13         12         44.0         44         02         140         460	et         T-04         Yafoq Bani Hamad         T-04         Existing projected deep well         13         18         46.5         44         05         46.8         1,381         1982         220           valen         T-05         Al Azaez         T-05/1         Marda'a Alhomary(1) Existing proj deep well         13         13         34.5         44         02         17.8         1,377         1985         120           valen         T-05         Wadd Masan (3)         Existing proj deep well         13         12         44.0         02         17.8         1,377         1985         150           ah         T-06         New projected deep well         13         12         44.0         44         02         38.0         1,465         160           ah         T-06         New projected deep well         13         06         21.0         43         45         03.9         539         2004         200					T-03/4	Al Meashaar(4) Existing proj.deep well	13	23 54.1	L	01 02.0	1			24.19	
T-05         AI Azaez         T-05/1         Mardata Alhomary(1) Existing proj. deep well         13         13         14         02         17         1985         120         8.20           T-06         AI Khunha         T-06         New projected deep well         13         12         44.0         44         02         1365         160            T-06         AI Khunha         T-06         New projected deep well         13         05         21.0         43         02         38.0         1,468         19967         160	value         T-05         Al Azaez         T-05/1         Mardata Alhomary(1) Existing proj. deep well         13         13         14.5         44         02         17.8         1.377         1985         120           ah         T-06         Al Khunha         T-06         New projected deep well         13         12         44.0         44         02         38.0         1.468         19967         160           ah         T-06         New projected deep well         13         06         21.0         43         45         03.9         539         2004         200         160		Al Mawaset	T-04	Yafoq Bani Hamad	T-04	Existing projected deep well	13			05 46.8		1982		124.10	
T-06         Al Khunha         T-06         New projected deep well         13         12         44.0         44         02         38.0         1.468         19967         160            T-06         Al Khunha         T-06         New projected deep well         13         06         21.0         43         45         03.9         539         2004         200	T-06         AI Khunha         T-06/3         Wadi Masan (3)         Existing proj. deep well         13         12         44.0         44         02         38.0         1.468         19967         160           ah         T-06         AI Khunha         T-06         New projected deep well         13         06         21.0         43         45         03.9         2004         200         200         2004         200         2004         200         2004         200         2004         200         2004         200         <		Al Shamayaten		Al Azaez	T-05/1	Marda'a Alhomary(1) Existing proj.deep well	13	13 34.		02 17.8				8.20	Replace T-05/3
T-06 Al Khunha T-06 New projected deep well 13 06 21.0 43 45 03.9 539 2004 200	ah 17-06 Ai Khunha T-06 New projected deep well 13 06 21.0 43 45 03.9 539 2004 200					7-06/3	Wadl Masan (3) Existing proj. deep well	13	12 44.1		02 38.0		_		1	Canceled (few water)
			A Wazieyah	99 -	Al Khunha	T-06	New projected deep well	13	06 21.				_		-0.53	

 Wells to be tested
 20

 Cancelled wels
 2

 Total wells tested
 18

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Pumping Te	Pumping Tests Informations									Step I	Step Drawdown	UMC		Const	ant dict	narge &	Constant dicharge & Recovery Test	Test
Governorate	District	Site	Site Name	Vell Code	Targel Waler Source	Depth.	SWL SWL	Pump depth	Ğ	Step   scharg	Step Drawdown discharge rate (I/sec)	)wn (l/sec)		(B)	L.W.L	2 5	Expect discharge rate	Constant discharge rate
			:			,,		(G.Lm)	1st	2nd	3rd	4 lh   5	5th		()	(E)	(l/sec)	(l/sec)
Sana'a	Hamdan	S-02	S-02 Jarban	S-02	New projected deep well	450	345.31	370				 1	34	346.04 34	346.10	0.06	1	0.3
	Belad Al Rous	S-05	S-05 Afesh	S-05	Existing projected deep well	300	212.97	270	0.7	1.4	2.1	2.8 3.	5	213.69 2:	231 93	18.24	4.0	- <b>6</b> 0-3
		S-06	S-06 AI Lejam	S-06	Existing projected deep well	300	148.09	265	1.3	2.6	3.9	5.2 6.	ري.	148.67 1	150.17	1.50	5.2	342.5
	Sannan & Bany Bahlool	S-07	S-07 Bait Al Hadrami	S-07	New projected deep well	410	193.22	162	1.9	3.8	5.7	7.6 9	9.5 19	193.80 19	197.70	3.90	4.0	33.5
		S-09	S-09 Ruhm	S-09	S-09 New projected deep well	470	191.85	291	1.0	2.0	3.0	4.0 5	5.0 19	193.10 2:	228.55	35.45	8.6	$0.5^{\circ}$
	Al Heso	S-10	S-10 Tawa'ar	S-10/1	S-10/1 Existing projected deep well	280	134.78	220	0.9	1.8	2.7	3.6 4	4.5 13	135.40 11	181.24	45.84	2.7	500 N
		2		S-10/2	S-10/2 Existing projected deep well	310	144.74	220	1.7	3.4	5,1	6.8 8	8.5 14	145.36 1	156.49	11.13	4.1	同語
	lehana	S-11	S-11 AI Hesn-Al Abyad	S-11/1	S-11/1 New projected deep well	350	152.82	248	1.2	2.4	3.6	4.8 6	6.0 15	154.78 2	219.79	65.01	4.8	10 Mar
		S-12	S-12 Mahdah	S-12	New projected deep well	350	57.78	246	1.3	2.6	6 E	5.2 8	6.5 58	60	77.34	18.74	2.8	<b>第1</b> 73章
Taiz	Mawiyah	T-01	T-01 Al Muayteeb	T-01	T-01 New projected deep well	300	139.17	213	1.0	2.0	3.0	4.0	5.0	1	1	1	<5.0	「市地ない
				T-02/1	T-02/1 Bir 1 Existing projected deep well	230	183.88	200	1.6	3.2	4.8	6.5	- 18	84.20 1	186.74	2.54	64	网际
		T-02	T-02 Bani Al Suror	T-02/3	T-02/3 Bir 3 Existing projected deep well	251	117.62	178	1.6	3.2	4.8	6.4 E	8.0 11	118.93 1	140.04	21.11	3.2	142.6 <b>3</b>
	Al Ma'afer			T-02/4	T-02/4 Bir 4 New projected deep well	190	134.92	154	1.7	3.4	5.1	6.8 6	8.5 13	137.91	140.16	2.25	6.8	國和憲
		T-03	T-03 Sheb Humran	T-03/1	T-03/1 AI Jah (1) New projected deep well	400	22.22	284	2.2	3.6	5.1	6.6 8	8.0 22.	81	45.10	22.29	4.9	UUXXX
				T-03/4	T-03/4 AI Meashaar(4) Existing proj.deep well	260	24.19	184	2.2	3.3	4.4	5.5 6	6.6 24.	95	28.99	4.04	5.3	<u>'</u> 48
	Al Mawaset	T-04	Yafoq Bani Hamad	T-04	T-04 Existing projected deep well	220	124.10	156	1.2	2.4	3.6	4.8 <u></u> E	6.0 12	25.30 1	127.21	1.91	3.6	10022
	Al Shamayaten	1-05	T-05 Al Azaez	T-05/1	T-05/1 Marda'a Alhomary(1) Existing proj deep well	120	8.20	94	1.0	1.5	2.0	2.5 3	3.0 B	8.99 5	54.18	45.19	2.5	0.633
	Al Wazieyah	T-06	T-06 AI Khunha	T-06	T-06 New projected deep well	200	-0.53	142	2.2	4.4	6.6	8.8   1	11.0 0	0.68	6.35	5.67	8.8	<b>8.8 %</b>
															1	1		

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# DATA FOR SANA'A

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# Pumping Test Report Sheet

Well code: S-02	Site code:	S-02 Site nam	ne:	Jarban
	amdan		norate:	Sana'a
				~
Target water source:	Vew projected de	eep well	Well depth: _	450 m
Contractor:	Abdulkhaleg N	I. AL- Goli		
Hydrogeologist in charge:	Ali Abdulla	ah Nagi AL- Gounaid		
Operator:	Mohmmed	Azeen		
Date of start of the test:	18/8/2006	Date of end	d of the test:	19/8/2006
Pump type: Submer	rsible pump	Engine:		37kW
Pump installation depth:	370 m	Datum leve	el: <u>0.73 m</u>	S.W.L.: <u>G.L363.31 m</u>
Step drawdown test				
Date/hour started:		Date/hour finished		Total hours:
Yield (l/sec): 1 <sup>st</sup> step	2 <sup>nd</sup> step	3 <sup>rd</sup> step	4 <sup>th</sup> step	5 <sup>th</sup> step
Water level before start the te	st (G.Lm):			
Water level after end of 5th ste	эр (G.Lm):			
Water level after recovery (G.	Lm):		Recovery hours	s:
Constant discharge test				
Date/hour started:	-2006-1:30pm	Date/hour finished	: <u>19-8-2006-3:</u>	50pm Total hours: 27:20
Yield (I/sec):2.00				
Water level before start of the tes	st (G.Lm):	345.31		
Water level after end of test (C	G.Lm):	345.37		
Water level after recovery (G.I	Lm):	345.31	Recovery hours	s: <u>3:20</u>
Drawdown (m): 0.06	_			
	—			
			•	
			N	
Revised by:				
Name ;	· · · · · · · · · · · · · · · · · · ·			· .
Date:				

### Constant Discharge & Recorery Test (1/2)

Well Code:	<u>S-02</u>	Site code:	S-02
Site name:	Jarban		
District:	Hamdan		
Governorate:	Sana'a		

 Pump on date/hour:
 18-8-2006-1:30pm

 Pump off date/hour:
 13/8/2006 2:00pm

 End of recovery hour:
 19-8-2006-3:50pm

S.W.L ( m ):	346.04
D.W.L ( m ):	346.10
Yield (l/sec):	2.0

Contractor: <u>Abdulkhaleg M. AL- Goli</u> Hydrogeologist: <u>Ali Abdullah Nagi AL- Gounaid</u> Operator: <u>Mohmmed Azeen</u>

	Cons	tant Dischrge Te	est	Recove	ery Test	Water Analysis	
Duration - (min)	Water level	Drawdown	Pumping	Water level	Residual	Conductivity	Remarks
(1111)	(m)	(m)	rate (l/sec)	(m)	(m)	( )	
0.0	346.04	0.00		346.10	0.06		d.
0.5	346.04	0.00		346.09	0.05		
1.0	346.05	0.01		346.09	0.05		
1.5	346.05	0.01		346.09	0.05		
2.0	346.05	0.01		346.09	0.05		
2.5	346.06	0.02		346.09	0.05		
3.0	346.06	0.02		346.09	0.05		×
3.5	346.06	0.02		346.09	0.05		
4.0	346.06	0.02		346.09	0.05		
4.5	346.07	0.03		346.09	0.05		
5.0	346.07	0.03		346.09	0.05		
6.0	346.07	0.03		346.09	0.05		
7.0	346.08	0.04		346.09	0.05		
8.0	346.08	0.04		346.09	0.05		
9.0	346.08	0.04		346.08	0.04		
10.0	346.09	0.05		346.08	0.04		
12.0	346.09	0.05		346.08	0.04		
14.0	346.10	0.06		346.08	0.04		
16.0	346.10	0.06		346.08	0.04		
18.0	346.10	0.06		346.08	0.04		
20.0	346.10	0.06		346.07	0.03		
25.0	346.10	0.06		346.07	0.03		
30.0	346.10	0.06		346.07	0.03		
35.0	346.10	0.06		346.07	0.03		
40.0	346.10	0.06		346.07	0.03		
45.0	346.10	0.06		346.07	0.03		
50.0	346.10	0.06	I	346.07	0.03		
55.0	346.10	0.06		346.06	0.02		
60.0	346.10	0.06		346.06	0.02		

## Constant Discharge & Recorery Test (2/2)

S-02

Well Code: District: <u>S-02</u>

Hamdan

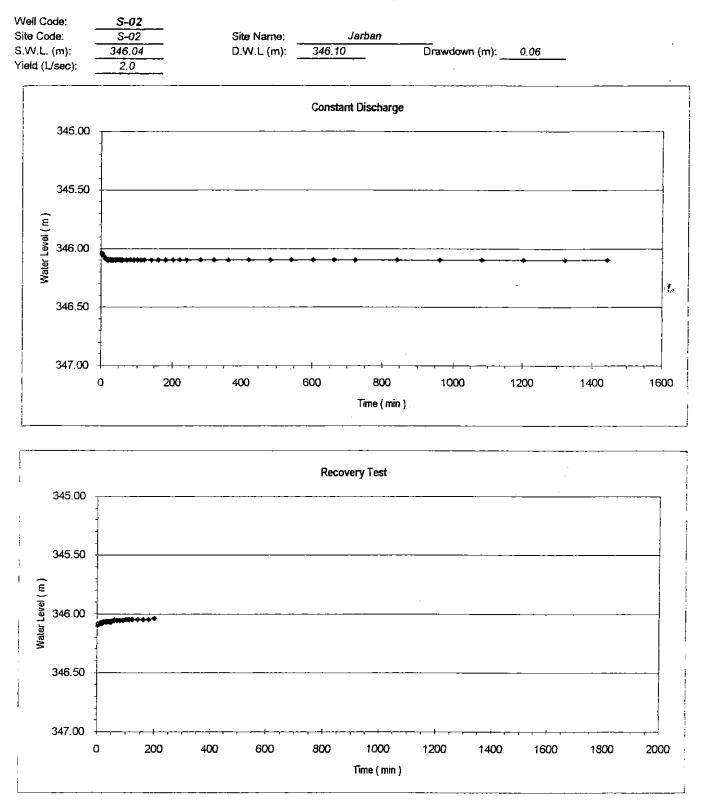
Site code:

Site name: Jarban

Governorate: Sana'a

Duration	Cons	tant Dischrge To	est	Recove	ery Test	Water Analysis	
Duration (min)	Water level (m)	Drawdown (m)	Pumping rate (I/sec)	Water level (m)	Residual (m)	Conductivity (µS/cm)	Remarks
70.0	346.10	0.06		346.06	0.02		
80.0	346.10	0.06		346.06	0.02		
90.0	346.10	0.06		346.06	0.02		
100.0	346.10	0.06		346.05	0.01		
110.0	346.10	0.06		346.05	0.01		
120.0	346.10	0.06		346.05	0.01		-1
140.0	346.10	0.06		346.05	0.01		
160.0	346.10	0.06		346.05	0.01		
180.0	346.10	0.06		346.05	0.01		
200.0	346.10	0.06		346.04	0.00		
220.0	346.10	0.06					
240.0	346.10	0.06					
280.0	346.10	0.06					4
320.0	346.10	0.06		<u></u>			
360.0	346.10	0.06					
420.0	346.10	0.06			<u>.</u>		
480.0	346.10	0.06					
540.0	346.10	0.06					
600.0	346.10	0.06					
660.0	346.10	0.06					
720.0	346.10	0.06					
840.0	346.10	0.06	_				
960.0	346.10	0.06					
1080.0	346.10	0.06					
1200.0	346.10	0.06			-		
1320.0	346.10	0.06					
1440.0	346.10	0.06					
1560.0							<u></u>
1680.0	<u> </u>						
1800.0							<u> </u>
	<u> </u>						
	<u> </u>	••• <b>—</b> •• <b>—</b> —	<u>+</u> †				

#### **Constant Dischrge Test**



# Pumping Test Report Sheet

Well code:	S-05	Site code:	<u>S-05</u>	s	ite name			Afesh		<b></b> .
District:	Be	lad Al Rous			Governo	rate:	·	Sana'a		
Target water	source:	Existing projecte	ed deep	well		Well dep	th:	150 m		
Contractor:		Abdulkhaleg	<u>M. AL</u>	- Goli						
Hydrogeologis Operator:		Ali Abdu Mohmme	-		ounaid					
Date of start of Pump type: Pump installa	Ve			Eng	e of end o ine: um level:	of the test: 	lv	05//08/20 veco aifo S.W.L.:		<u>2.97 m</u>
	rted: <u>3</u> 1 <sup>st</sup> step <u>1.</u>	<u>-8-2006-8:40am</u> 002 <sup>nd</sup> step e test (G.Lm):						am Tota 5 <sup>th</sup> step		23:55
	'ter end of 5 <sup>h</sup>	step (G.Lm):		245.67 212.97		Recovery	hours:	13:55	i	
Constant dis Date/hour sta Yield (l/sec):		= -8-2006-8:40am	Da	ite/hour	finished:	5-8-20	06-8:20	o <u>m</u> Tota	al hours:	36:00
Water level bef		- e test (G.Lm):		212.97						
Water level at	ter end of tes	st (G.Lm):		231.93						
Water level at	-			20.97		Recovery	hours:	12:00	)	
Drawdown (m Revised by: Name :	i): <u>18.9</u>	6								

14-233

### **Provisional Step Drawdown Test**

Well Code:	<u></u>	Site code:	S-05
Site name:	Afesh		
District:	Belad Al Rous		
Governorate:	Sana'a		

Pump on date/hour:	2-8-2006-6:20am
Pump off date/hour:	2-8-2006-8:40pm
End of recovery hour:	3-8-2006-4:15am
S.W.L ( m ):	213.69

Contractor: <u>Abdulkhaleg M. AL- Goli</u> Hydrogeologist: <u>Ali Abdullah Nagi AL- Gounaid</u>

Operator: Mohmmed Azeen

[]	1st S	Step	2nd S	Step	3rd S	Step	4th S	Step	5th S	Step	
Duration (min)	W.L. (m)	Yield ( l/sec)	W.L. (m)		W.L. (m) i	Yield ( l/sec)	W.L. (m)	Yield (I/sec)	W.L. (m)	Yield ( l/sec)	Recovery (m)
0.0	213.69	1.00	221.98	2.00	223.88	3.00	224.71	4.00	225.09	5.00	225.42
0.5	219.85		222.91		224.51		224.75		225.10		219.73
1.0	220.04		223.02		224.51		224.77		225.12		đ.
1.5	220.12		223.16		224.51	<u>.</u>	227.77		225.13		
2.0	220.20		223.22	-	224.51		224.78		225.14		
2.5	220.26		223.26	<u> </u>	224.52		224.79		255.15		
3.0	220.39		223.32		224.53		224.80		255.16		
3.5	220.93		223.36		224.53		224.81		255.16		
4.0	220.71		223.39		224.53		224.82		255.17		
4.5	220.83		223.42		224.54		224.83		255.17		
5.0	221.09		223.44		224.55		224.84		255.18		
6.0	221.11	-	223.46		224.56		224.85		255.20		
7.0	221,12		223.48		224.57		224.86		255.21		
8.0	221.43		223.51		224.58		224.88		255.22		
9.0	221.48		223.58		224.59		224.90		255.23		
10.0	221.51		223.63		224.60		224.91		225.25	·	
12.0	221.63		223.68		224.61		224.93		255.26		217.80
14.0	221.74		223.72		224.62		224.94		225.28		216.82
16.0	221.76		223.74		224.63		224.96	-	255.30		215.76
18.0	221.79		223.76	·	224.64		224.98		255.31		214.72
20.0	221.84		223.78		224.65		225.00		255.33		
22.0	221.90		223.80		224.67		225.02		255.34		
24.0	221.92		223.82		224.68		225.04		255.36		· · · · -
26.0	221.94		223.84		224.69		225.05	_	255.38		
28.0	221,96		223.86		224.70		225.07		255.40		
30.0	221,98		223.88		224.71		225.09		255.42		214.21
4:15am							_ *				213.69
	<u> </u>								····		
									<u>.</u>	<u> </u>	
							. <u>.</u>				
	··· —		i		<u> </u>		i		· · · · · · · · · · · · · · · · · · ·		
	<u>:</u>				<u> </u>	-234	<u>_</u>		<u> </u>		

Pump on date/hour:	3-8-2006-8:40am
Pump off date/hour:	3-8-2006-6:40pm
End of recovery hour:	4-8-2006-8:35am
S.W.L ( m ):	213.69

Contractor: <u>Abdulkhaleg M. AL- Goli</u> Hydrogeologist: <u>Ali Abdullah Nagi AL- Gounaid</u>

Operator: Mohmmed Azeen

	1st S	Slep	2nd S	Step	3rd S	Step	4th S	Step	5th S	Step	Deserver
Duration (min)	W.L. (m)	Yield ( l/sec)	W.L. (m)	Yield (I/sec)	W.L. (m)	Yield ( l/sec)	W.L. (m)	Yield (1/sec)	W.L. (m)	Yield (I/sec)	Recovery (m)
0.0	213.69	1.00	219.92	2.00	224.31	3.00	234.59	4.00	237.63	5.00	246.39
0.5	218.50		220.08		224.86		234,71		237.99		239.40
1.0	218.75		220.67		224.88	<u> </u>	234.89		238.00	·	234.42 🦸
1.5	218.81		220.96		225.00		235.02		240.16		231.22
2.0	218.84	1	221.19		225.11		235.21		241.07		229.11
2.5	218.89		221.48		225.60		235.55		241.82		227.03
3.0	218.91		221.79	-	225.81		235.73		242.09		226.17
3.5	218.94		221.88		225.99		235.94		242.56		225.41
4.0	218.97	·	222.00		,226.00		236.16		243.09		224.82
4.5	218.98		222.29		226.07		236.24		243.51		224.41
5.0	218.99		222.41		226.11		236.29		243.62		223.36
6.0	219.00		222.68		226.80	- /-	236.32		243.92		222.43
7.0	219.27		222.91		228.24		236.37		243.93		221.81
8.0	219.40		223.11		228.48		236.54		243.98		221.03
9.0	219,48		223.27		228.55		236.76		244.32		220.64
10.0	219.54		223.58		228.60		236.83		244.60		220.45
12.0	219.60		223.65		229.00		236.83		244.71		220.14
14.0	219,69		223.78		230.69		236.92		244.72		220.04
16.0	219.69		223.91		231.19		236.92		244.75		219.66
18.0	219.74		224.00		231.57		236.95		245.02		219.47
20.0	219.80		224.06		231.61		236.96		245.24	-	219.15
25.0	219.85		224.11		231.97		236.98		245.59		218.84
30.0	219.87		224.13		232.00		237.02		245.94		218.12
35.0	219.89		224.15	-	232,41		237.05		246.22		217.79
40.0	219.90		224.18		232.74		237.11		246.23		217.46
45.0	219.90		224.18		232.96		237.15		246.27		217.23
50.0	219,90		224.18		233.10		237.21		246.29		217.03
55.0	219.90		224.19		233.62		237.26		246.37		216.95
60.0	219.90		224.19		233.85		237.32		246.37		216.81
70.0	219.90		224.20		234.01		237.45		246.37		216.69
80.0	219.90		224.21		234.09		237.56		246.38		216.24
90.0	219.91		224.25		234.17		237.5 <del>9</del>		246.38		216.01
100.0	219,91		224.29		234.26		237.61		246.39		215.96
110.0	219.92		224.31		234.47		237.62		246.39	-	215.79
120.0	219,92		224.31		234.59		237.63		246.39		215.69
695.0	8:35am						1				213.69
						4-2 <u>35</u>			_ T		

# Constant Discharge & Recorery Test (1/2)

Well Code:	S-05	Site code:	S-05
Site name:	Afesh		
District:	Belad Al Rous		
Governorate:	Sana'a		

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Contractor: <u>Abdulkhaleg M. AL- Goli</u> Hydrogeologist: <u>Ali Abdullah Nagi AL- Gounaid</u> Operator: <u>Mohmmed Azeen</u>

Pump on date/hour: _	4-8-2006-8:40am
Pump off date/hour:	5-8-2006-8:40am
End of recovery hour:	5-8-2006-8:20pm

S.W.L ( m ):	213.69	
D.W.L.(m):	231.93	
Yield (1/sec):	3.2	

	Cons	tant Dischrge Te	est	Recove	ry Test	Water Analysis	
Duration (min)	Water level (m)	Drawdown (m)	Pumping rate (l/sec)	Water level (m)	Residual (m)	Conductivity ()	Remarks
0.0	213.69	0.00		231.93	18.24		
0.5	214.50	0.81		228.13	14.44		
1.0	216.82	3.13		222.43	8.74		
1.5	217.11	3.42		221.35	7.66		
2.0	218.99	5.30		220.90	7.21		
2.5	219.85	6.16		219.82	6.13		
3.0	221.18	7.49	1	218.50	4.81		
3.5	222.86	9.17		217.50	3.81		
4.0	223.63	9.94	<b>_</b>	216.48	2.79		
4.5	224.72	11.03		216.27	2.58		
5.0	225.38	11.69		216.23	2.54		
6.0	226.00	12.31		216.06	2.37		
7.0	226.45	12.76		215.95	2.26		
8.0	226.63	12.94		215.46	1.77		
9.0	226.80	13.11		215.13	1.44		
10.0	227.11	13.42	<u> </u>	215.01	1.32		
12.0	227.23	13.54		214.89	1.20		
14.0	227.47	13.78		214.68	0.99		
16.0	227.56	13.87		214.60	0.91		
18.0	227.79	14.10		214.49	0.80		
20.0	227.79	14.10		214.45	0.76		
25.0	227.98	14.29		214.40	0.71		
30.0	228.06	14.37		214.36	0.67		
35.0	228.18	14.49		214.32	0.63		
40.0	228.28	14.59		214.28	0.59		
45.0	228.64	14.95		214.26	0.57		
50.0	229.12	15.43		214.22	0.53		
55.0	229.54	15.85		214.18	0.49		
60.0	230.43	16.74	1	214.14	0.45		

## Constant Discharge & Recorery Test (2/2)

S-05

Well	Code:
Distr	ict:

S-05

Belad Al Rous

Site code:

Site name: Afesh

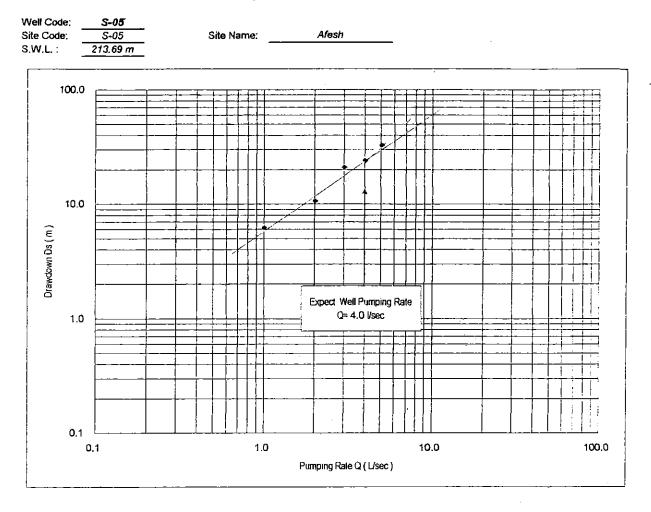
Governorate: Sana'a

Duretion	Cons	tant Dischrge Te	est	Recove	ery Test	Water Analysis	
Duration (min)	Water level (m)	Drawdown (m)	Pumping rate (I/sec)	Water level (m)	Residual (m)	Conductivity	Remarks
70.0	230.88	17.19		214.06	0.37		
80.0	230.99	17.30		214.00	0.31		
90.0	231.42	17.73		213.94	0.25		
100.0	231.48	17.79		213.88	0.19		
110.0	231.54	17.85		213.82	0.13		
120.0	231.64	17.95		213.76	0.07		
140.0	231.69	18.00		213.76	0.07		
- 160.0	231.69	18.00	-	213.75	0.06		
180.0	231.70	18.01		213.74	0.05		· · · · · ·
200.0	231.73	18.04		213.73	0.04		
220.0	231.73	18.04		213.72	0.03		
240.0	231.73	18.04		213.70	0.01		
280.0	231.75	18.06		213.70	0.01		
320.0	231.76	18.07		213.70	0.01		
360.0	231.78	18.09		213.70	0.01		
420.0	231.78	18.09		213.70	0.01		
480.0	231.79	18.10		213.70	0.01		
540.0	231.81	18.12		213.70	0.01		
600.0	231.85	18.16		213.70	0.01		
660.0	231.88	18.19		213.70	0.01		
720.0	231.89	18.20		213.69	0.00		
840.0	231.91	18.22					
960.0	231.91	18.22					
1080.0	231.91	18.22					
1200.0	231.92	18.23					
1320.0	231.92	18.23					
1440.0	231.93	18.24					
						<u> </u>	

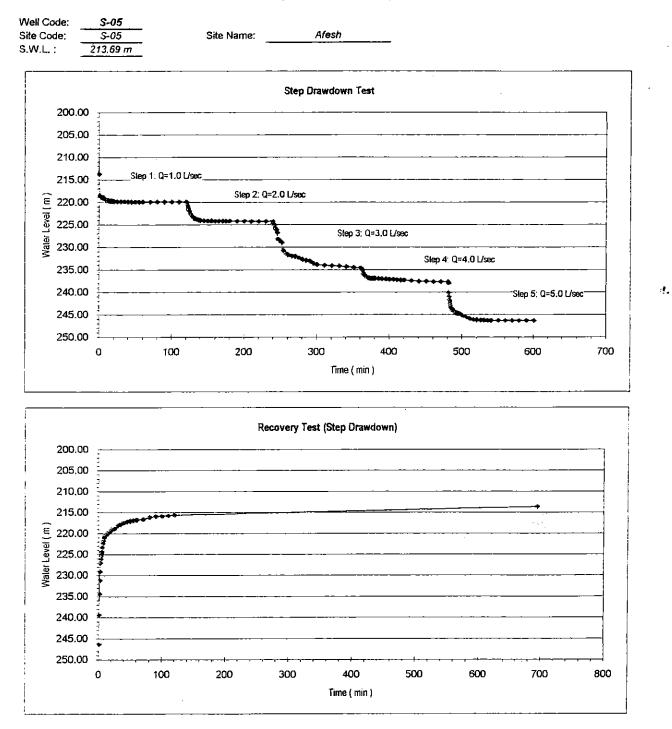
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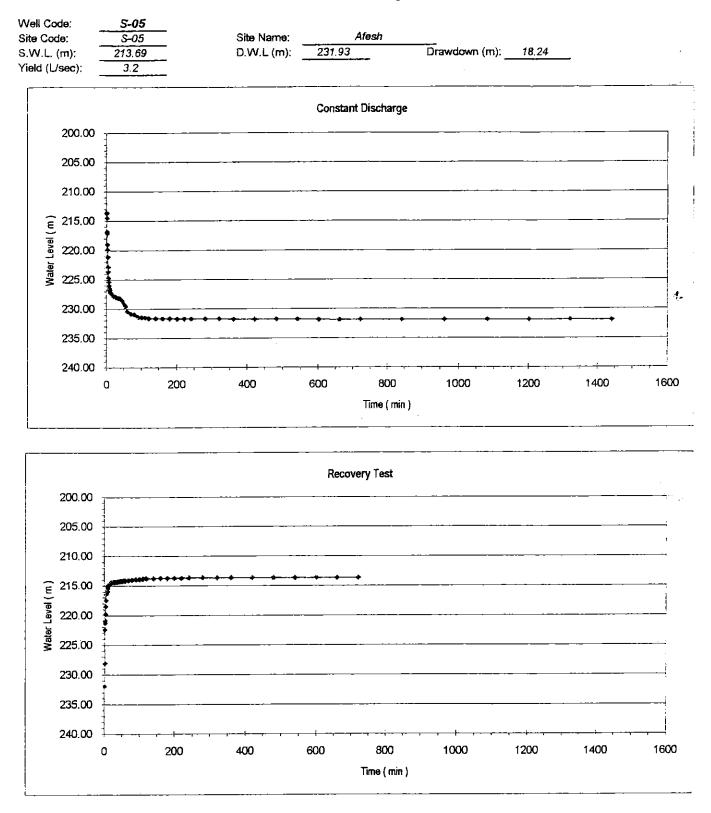
.....



Slep	Q(1/sec)	D.W.L.(m)	Ds(mi)		
1	1.0	219.92	6,23		
2	2.0	224.31	10.62		
3	3,0	234.59	20.90		
4	4.0	237.63	23.94		
5	5.0	246.39	32,70		



#### Constant Dischrge Test



 $14 \cdot 240$ 

# Pumping Test Report Sheet

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	0.00			-
Well code: <u>S-06</u> Site code:		::		<u> </u>
District: Sanhan & Bany Bahlool	Governo	orate:	Sana'a	
Target water source:Existing projected	deep well	Well depth:	<u>310 m</u>	
Contractor: Abdulkhaleg M	1. AL- Goli	<u> </u>		
Hydrogeologist in charge: Ali Abdulla	h Nagi AL- Gounaid			
Operator: Mohammed	l Azeen			
				4.
Date of start of the test:21/8/2006	Date of end	of the test:	24/8/2006	_
Pump type: Vertical pump	Engine:		lveco aifo	_
Pump installation depth: 220 m	Datum level:	0.58 m	S.W.L.: <u>G.L1</u>	48.09 m
	•	4 <sup>th</sup> step <u>5.2</u>	<u>3:48pm</u> Total hours: 20 5 <sup>th</sup> step <u>6.50</u> urs: <u>0:18</u> 3:00pm_ Total hours:	
Water level after recovery (G.Lm):	148.10	Recovery hou	irs: <u>9:00</u>	
Drawdown (m): <u>1.50</u>				
Revised by: Name : Date:			×	

### Provisional Step Drawdown Test

Well Code:	S-06	Site code:	<u>S-06</u>	Pump on date/hour:	21-8-2006-3:50pm
Site name:	Al Lejam		_	Pump off date/hour:	21-8-2006-6:20pm
District:	Sanhan & Bany Ba	ahlool	_	End of recovery hour:	21-8-2006-6:30pm
Governorate:	Sana'a		_	S.W.L ( m ): _	148.67

Contractor: Abdulkhaleg M. AL- Goli

Hydrogeologist: Ali Abdullah Nagi AL- Gounaid

Operator: Mohammed Azeen

	1st S	Step	2nd	Step	3rd \$	Step	4th	Step	5th S	Step	
Duration (min)	W.L. (m)	Yield ( l/sec)	W.L. (m)	Yield (I/sec)	W.L. (m)	Yield ( l/sec)	W.L. (m)	Yield ( l/sec)	W.L. (m)	Yield ( l/sec)	Recovery (m)
0.0	148.67	1.30	148.83	2.60	148.92	3,90	149.43	5.20	149.93	6.50	150.51
0.5	148.74		148.86		149.25		149.81		150.27		148.92
1.0	148.76		148.89		149.41		149.85		150.38		148.87
1.5	148.77		148.91		149.42		149.88		150.44		148,81
2.0	148.77		148.92		149.42		149.92		150.45		148.77
2.5	148.79		148.92		149.42		149.93		150.47		148.71
3.0	148.79		148.92		149.43		149.93		150.51		148.69
3.5	148.79		148.92	<del>.</del> .	149.43		149.93		150.51		148.68
4.0	148.80		148.92		149.43		149.93		150.51		148.68
4.5	148.80		148,92		149.43		149.93		1 <del>5</del> 0.51		148.68
5.0	148.81		148.92		149.43		149.93		150.51		148.68
6.0	148.81		148.92		149.43		149.93		150.51		148.67
7.0	148.81		148.92		149.43		149.93		150.51		148.67
8.0	148.81		148.92		149.43		149.93		150.51		148.67
9.0	148.82		148.92	-	149.43		149.93		150.51		148.67
10.0	148.82		148.92		149.43		149.93		150.51		148.67
12.0	148.83	-	148.92		149.43		149.93		150.51	-	
14.0	148.83		148.92		149.43		149.93		150.51		
16.0	148.83		148.92		149.43		149.93		150.51		
18.0	148.83		148.92		149.43		149.93		150.51		
20.0	148.83	_	148.92		149.43		149.93		150.51		
22.0	148.83		148.92		149,43		149.93		150.51	-	
24.0	148.83		148.92		149.43		149.93		150.51		
26.0	148.83		148.92		149.43		149.93		150.51		
28.0	148.83		148.92		149.43		149.93		150.51		
30.0	148.83		148.92		149.43		149.93		150.51		
35.0											
40.0											
45,0											
50.0											
60.0											<u> </u>
70.0											
80.0											
90.0									<u>.</u>		
110.0			·								
120.0											
240.0											
300.0											
360.0							<del>;</del>		· · · · ·		
420.0							· · · · ·				

Site code:	S-06
Bahlool	
<u></u>	

Pump on date/hour:	22-8-2006-10:30am
Pump off date/hour:	22-8-2006-8:30pm
End of recovery hour:	22-8-2006-8:48рт
S.W.L ( m ):	148.67

Contractor: <u>Abdulkhaleg M. AL- Goli</u> Hydrogeologist: Ali Abdullah Nagi AL- Gounaid\_\_\_\_\_

Operator: Mohammed Azeen

	1st S	Step	2nd	Step	3rd S	Step	4th	Step	5th S	Step	Decour -
Duration (min)	W.L. (m)	Yield ( l/sec)	W.L. (m)	Yield ( l/sec)	W.L. (m)	Yield ( l/sec)	W.L. (m)	Yield ( l/sec)	W.L. (m)	Yield ( l/sec)	Recovery (m)
0.0	148.67	1.30	148.81	2.60	149.24	3.90	149.74	5.20	150.23	6.50	150.53
0.5	148.74		149.18	· · · · · · · · · · · · · · · · · · ·	149.54		150.12		150.34		148.95
1.0	148.76		149.19		149.65		150.20		150.37		148.87
1.5	148.77		149.20		149,67		150.21		150.39		148.83
2.0	148.78		149.21		149.67		150.21		150.40		148.78
2.5	148.78		149.21		149.68		150.21		150.43		148.75
3.0	148.79		149.22		149.68		150.21		150.43		148.71
3.5	148.79		149.22		149.70		150.22		150.43		148.69
4.0	148.80		149.22		149.70		150.22		150.44		148.69
4.5	148.81		149.22		149.70		150.22		150.44		148.69
5.0	148.81		149.22		149.70		150.22		150.44		148.69
6.0	148.81		149.22		149.70		150.22	1	150.44		148.68
7.0	148.81		149.22		149.70		150.22		150.45		148.68
8.0	148.81		149.22		149.70		150.23		150.45		148.67
9.0	148.81		149.23		149.70		150.23		150.45		148.67
10.0	148.81		149.23		149.70	-	150.23		150.45		148.67
12.0	148.81		149.23		149.70		150.23		150.45		148.67
14.0	148.81		149.23		149.70		150.23		150.46	1	148.67
16.0	148.81		149.23		149.71		150.23		150.46		148.67
18.0	148.81		149.23		149.71		150.23		150.47		148.67
20.0	148.81		149.23		149.71		150.23		150.48		
25.0	148.81		149.23		149.71		150.23		150.48		<u> </u>
30.0	148.81		149.23		149.72		150.23	1	150.48		
35.0	148.81		149.23		149.72		150.23		150.48		
40.0	148.81		149.23		149.72	ŀ	150.23		150.48	ľ	
45.0	148.81		149.23		149.72	1	150.23		150.49		
50.0	148.81		149.23		149.72		150.23		150.50		
55.0	148.81		149.23		149.72		150.23		150.51		
60.0	148.81	1	149.23		149.72		150.23		150.51		
70.0	148.81		149.23		149.72		150.23		150.52		
80.0	148.81		149.23		149.73		150.23		150.52		
90.0	148.81		149.24		149.73		150.23		150.52		
100.0	148.81		149.24		149.74		150.23		150.52		
110.0	148.81		149.24		149.74		150.23		150.53		
120.0	148.81		149.24		149.74		150.23		150.53		

# Constant Discharge & Recorery Test (1/2)

Well Code:	<u>S-06</u>	Site code:	S-06
Site name:	Al Lejam	<u> </u>	
District:	Sanhan & Bany Bahlool		
Governorate:	Sana'a		

Contractor: <u>Abdulkhaleg M. AL- Goli</u> Hydrogeologist: <u>Ali Abdullah Nagi AL- Gounaid</u> Operator: <u>Mohammed Azeen</u>

Pump on date/hour:	23-8-2006-6:00am
Pump off date/hour:	24-8-2006-6:00am
End of recovery hour:	24-8-2006-3:00pm

S.W.L ( m ):	148.67	
D.W.L ( m ):	150.17	
Yield (l/sec):	4.2	

Duration	Constant Dischrg		: Dischrge Test		ry Test	Water Analysis	
(min) Water level Drav	Drawdown (m)	Pumping rate (l/sec)	Water level (m)	Residual (m)	Conductivity ( )	Remarks	
0.0	148.67	0.00		150.17	1.50		<u>₹</u> _
0.5	149.58	0.91		149.62	0.95		
1.0	149.73	1.06		149.24	0.57		
1.5	149.77	1.10	·	149.12	0.45		
2.0	149.80	1.13	1	148.96	0.29		
2.5	149.81	1.14		148.84	0.17		
3.0	149.81	1.14		148.78	0.11		
3.5	149.82	1.15		148.78	0.11		
4.0	149.83	1.16		148.78	0.11		
4.5	149.83	1.16		148.77	0.10		
5.0	149.83	1,16		148.77	0.10		<u>_</u> _
6.0	149.83	1.16		148.76	0.09		
7.0	149.83	1.16		148.76	0.09	T	
8.0	149.83	1.16		148.76	0.09		
9.0	149.83	1.16		148.76	0.09		
10.0	149.83	1.16		148.76	0.09		
12.0	149.84	1.17		148.74	0.07		
14.0	149.84	1.17		148.74	0.07		
16.0	149.84	1.17		148.73	0.06		
18.0	149.84	1.17		148.74	0.07		
20.0	149.84	1.17		148.71	0.04		
25.0	149.84	1.17		148.69	0.02		
30.0	149.84	1.17		148.69	0.02		
35.0	149.84	1.17		148.69	0.02		
40.0	149.84	1.17		148.69	0.02		
45.0	149.84	1.17		148.69	0.02		
50.0	149.84	1.17	·	148.69	0.02		
55.0	149.84	1.17		148.69	0.02		
60.0	149.84	1.17		148.69	0.02		

# Constant Discharge & Recorery Test (2/2)

S-06

Well	Code:
Distri	ict:

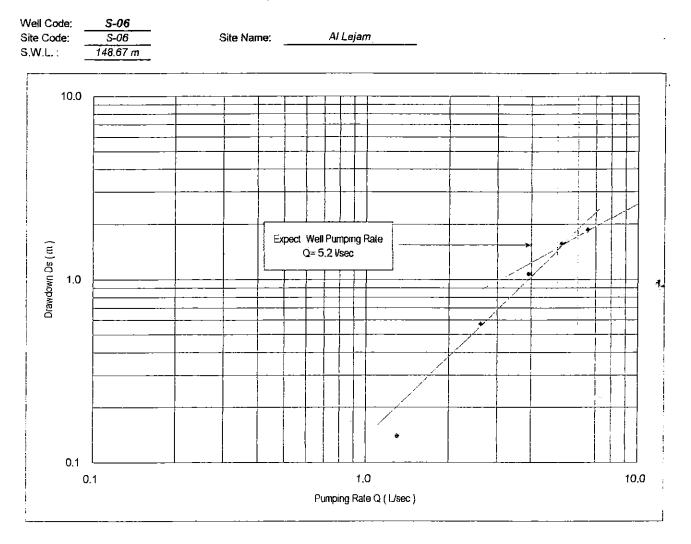
S-06 Site code:

Sanhan & Bany Bahlool

Site name: Al Lejam

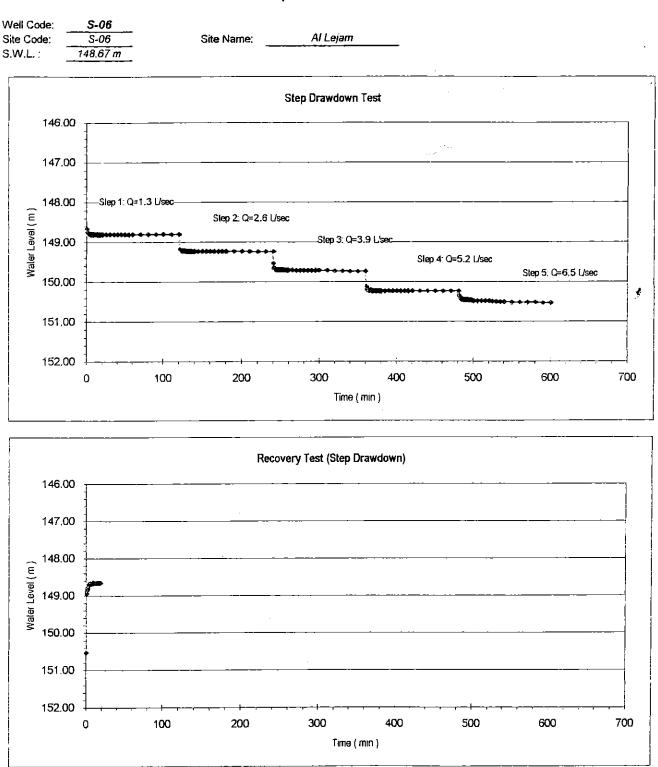
Governorate: Sana'a

	Constant Dischrge Test		est	Recove	ery Test	Water Analysis	
Duration ( min )	Water level (m)	Drawdown (m)	Pumping rate (I/sec)	Water level (m)	Residual (m)	Conductivity ()	Remarks
70.0	149.84	1.17		148.69	0.02		
80.0	149.84	1.17		148.69	0.02		
90.0	149.85	1.18		148.69	0.02		
100.0	149.85	1.18		148.69	0.02		
110.0	149.85	1.18		148.69	0,02		
120.0	149.86	1.19		148.69	0.02		1_
140.0	149.86	1.19		148.69	0.02		
160.0	149.87	1.20		148.69	0.02		
180.0	149.87	1.20		148.68	0.01		
200.0	149.88	1.21		148.68	0.01		
220.0	149.88	1.21		148.68	0.01		
240.0	149.89	1.22		148.68	0.01		<u>, _</u> _
280.0	149.89	1.22		148.68	0.01		
320.0	149.90	1.23		148.68	0.01		
360.0	149.91	1.24		148.68	0.01		
420.0	149.95	1.28		148.68	0.01		
480.0	149.93	1.26		148.68	0.01		
540.0	149.93	1.26		148.68	0.01		
600.0	149.93	1.26					
660.0	149.95	1.28					_
720.0	149.95	1.28					
840.0	150.09	1.42					
960.0	150.09	1.42					
1080.0	150.12	1.45					
1200.0	150.13	1.46					
1320.0	150.16	1.49					
1440.0	150.17	1.50					
		<u></u>					
	<del></del>						

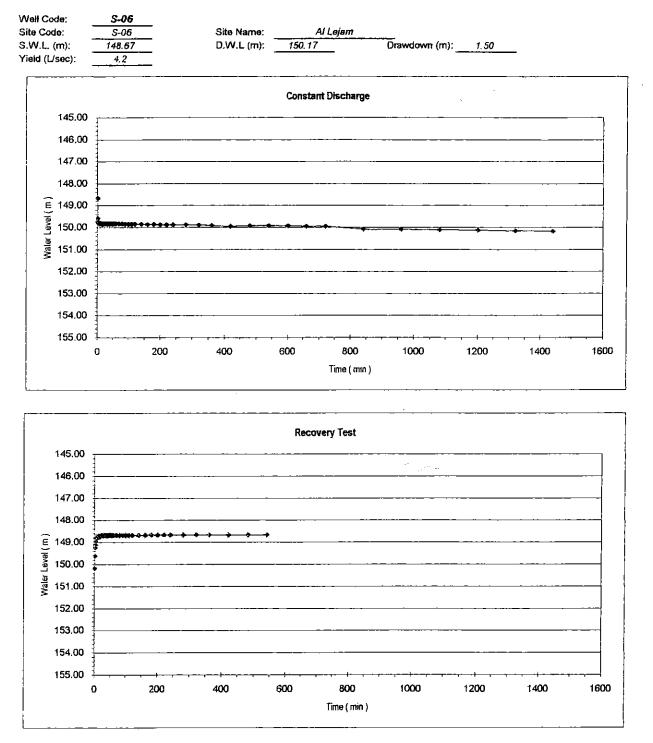


Step	Q (1/sec)	D.W.L.(m)	Ds(m)
1	1.3	148.81	0.14
2	2.6	149.24	0.57
3	3,9	149.74	1.07
4	5.2	150.23	1.56
5	6.5	150,53	1.86

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#### **Constant Dischrge Test**

# Pumping Test Report Sheet

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Well code:	S-07	Site code:	S-07	Site name	e: 1	Bait Al Hadram	ni
District:		& Bany Bahlool		Governe		Sana'a	
Target water	r source:l	Existing projecte	d deep w	ell	Well depth:	410 m	
Contractor:		Abdulkhaleg	<u>M. AL- G</u>	oli			
Hydrogeologi	ist in charge:	Ali Abdu	llah Nagi	AL- Gounaid			
Operator:	<u> </u>	Bu	lul	·			
Date of start	of the test:	31/07/2000	ô	Date of end	of the test:	04/08/20	006
Pump type:	Ve	rtical pump		Engine:	<u> </u>	lveco aifo	
		291 m_		Datum level:	0.58 m	S.W.L.:	G.L193.22 m
Step drawd	own test						
Date/hour sta	arted: <u>1-</u>	8-2006-9:55pm	_ Date/	hour finished:	2-8-2006-2	2:55pmTot	al hours: <u>17:00</u>
Yield (l/sec):	1 <sup>st</sup> step	02 <sup>nd</sup> step	3 <i>.80</i> _3 <sup>rd</sup>	step <u>5.70</u>	_4 <sup>th</sup> step	60 5 <sup>th</sup> step	9.50
Water level b	efore start the	test (G.Lm):		3.22			
Water level a	fter end of 5 <sup>th</sup> .	step (G.Lm):	2(	0.27			
Water level a	fter recovery (	G.Lm):	19	3.22	Recovery ho	urs: <u>7:00</u>	
Constant di	scharge test_						
Date/hour sta	arted: 2-8	3-2006-10:40pm	Date/	hour finished:	4-8-2006-3	<u>.:40am</u> Tota	al hours: _ 29:00
Yield (l/sec):	3.20						
Water level be	fore start of the	test (G.Lm):	19	3.22			
Water level a	fter end of test	: (G.Lm):	20	0.29			
Water level a	fter recovery (	G.Lm):	19	3.22	Recovery ho	urs: <u>5:00</u>	
Drawdown (n	n): <u>7.07</u>						
Revised by:							
	<del>.,</del>	· · · · · · · · · · · · · · · · · · · _ · · _ · · · _ = ~ - ~ - ~ - ~ - ~ - ~ - ~ - ~ - ~ - ~					
Name :							

Date:

## **Provisional Step Drawdown Test**

Well Code:	<u>S-07</u>	Site code:	<u> </u>
Site name:	Bait Al Hadrami		
District:	Sanhan & Bany Bahloo	· · · · · ·	
Governorate:	Sana'a		
Governorate:	Sana'a		

Pump on date/hour:	31-7-2006-11:00pm
Pump off date/hour:	31-7-2006-1:30am
End of recovery hour:	1-8-2006-8:15am
S.W.L ( m ):	193.80

Contractor: Abdulkhaleg M. AL- Goli

Hydrogeologist: <u>Ali Abdullah Nagi AL- Gounaid</u>

Operator: Bulul

<b>-</b>	1st S	Step	2nd	Step	3rd S	Step	4th	Step	5th S	Step	
Duration (min)	W.L.	Yield	W.L.	Yield	W.L.	Yield	W.L.	Yield	W.L.	Yield	Recovery (m)
	(m)	(I/sec)	(m)	( l/sec)		(I/sec)	(m)	(I/sec)	(m)	(l/sec)	
0.0	193.80	1.90	198.10	3.80	198.89	5.70	199.60		200.14	9.50	200.85
0.5	197.15		198.45		199.21		199.86		200.42	_	198.22
1.0	197.72		198.61		199.33		199.91		200.52		197.11
1.5	197.86		198.73		199.41		199.99		200.62		196.02
2.0	197.93		198.76		199.42		200.05		200.73		195.07
2.5	198.00		198.80		199.46		200.08	·	200.75		194.53
3.0	198.00		198.80		199.48		200.08		200.76		193.51
3.5	198.00		198.80	<u></u>	199.48		200.08		200.78		193.49
4.0	198.00		198.80		199.48		200.08		200.78		193.32
4.5	198.00		198.80		199.48		200.08		200.79		193.07
5.0	198.00		198.80		199.48		200.08		200.80		194.06
6.0	198.00		198.80		199.89		200.10		200.81		194.06
7.0	198.00		198.80		199.50		200.11		200.82		194.05
8.0	198.01		198.82		199.51		200.12		200.82		194.05
9.0	198.02		198.84		199.53		200.12		200.82		194.04
10.0	198.03		198.86		199.55		200.12		200.83		194.04
12.0	198.04		198.88		199.56		200.12		200.83		194.04
14.0	198.06		198.88		199.56		200.13		200.83		194.03
16.0	198.07		198.88		199.56		200.13		200.84		194.03
18.0	198.08		198.88		199.57		200.13		200.84		194.03
20.0	198.09		198.88		199.57		200.13		200.84		194.03
22.0	198.10		198.88		199.58		200.14		200.84		194.02
24.0	198.10		198.88		199.58		200.14		200.84		194.01
26.0	198.10		198.88		199.58		200.14		200,85		194.00
28.0	198.10		198.89		199.59		200.14		200.85		193.99
30.0	198.10		198.89		199.60		200.14		200.85		193.99
35.0			<u> </u>								193.98
40.0											193.97
45.0					. !						193.95
50,0											193.94
60.0											193.94
70.0											193.93
80.0											193.93
90,0											193.93
110.0				]							193.88
120.0							<u> </u>				193.85
240.0			1					. =			193.81
300.0											193.80
360.0											193.80
420.0			!		1						193.80

Well Code:	<u> </u>	Site code:	<u>S-07</u>
Site name:	Bait Al Hadrami		
District:	Sanhan & Bany Bahloo		
Governorate:	Sana'a		

Pump on date/hour:	1-8-2006-9:55pm
Pump off date/hour:	2-8-2006-7:55am
End of recovery hour:	2-8-2006-2:55pm
S.W.L ( m ):	193.80

Contractor: Abdulkhaleg M. AL-Goli

Hydrogeologist: Ali Abdullah Nagi AL- Gounaid

Operator: Bulul

<b>D</b>	1st S	Step	2nd :	Step	3rd S	Step	4th \$	Step	5th S	Step	Dessus
Duration (min)	W.L.	Yield	W.L.	Yield	W.L.	Yield	W.L.	Yield	W.L.	Yield	Recovery
(11111)	(m)	(l/sec)	(m) <sup>-</sup>	( l/sec)	(m)	(l/sec)	(m)	(I/sec)	(m)	(I/sec)	(11)
0.0	193.80	1.90	197.24	3.80	198.03	5.70	199.21	7.60	200.16	9.50	200.87
0.5	195.33		197.62		198.35		199.65		200.25		198.25
1.0	196.50		197.85		198.71		200.00		200.35		197.26
1.5	196.20	<u> </u>	198.00		198.89		200.00		200.43		196.83
2.0	196.21		198.00		198.91		200.00		200.47		196.35
2.5	196.23		198.00		198.99		200.00		200.50		196.02
3.0	196.26		198.00		199.00		200.00		200.53		195.85
3.5	196.31		198.00		199.00		200.00		200,57		195.23
4.0	196.37		198.00		199.00		200.00		200.59		195.00
4.5	196.42		198.00	•	199.00		200.01		200.63		194.72
5.0	196.48		198.01		199.00		200.01		200.65		194.71
6.0	196.55		198.01		199.00		200.01		200.65		194.70
7.0	196.61		198.01		199.01		200.02		200.65		194.55
8.0	196.66		198.01		199.01		200.02		200.65		194,47
9.0	196.72		198.01		199 <i>.</i> 01		200.03		200.65		194.40
10,0	196.77		198.01		199.01		200.04		200.65		194.36
12.0	196.80		198.01		199.02		200.05		200.65		194.35
14.0	196.92		198.01		199.03		200.06		200.65		194.29
16.0	196.95		198.01	Ĩ	199.05		200.07		200.67	·	194.28
18.0	196.98		198.02		199.07		200.08		200.73		194.25
20.0	197.00		198.02		199.07		200.10		200.79		194.19
25.0	197.05		198.02		199.08		200.12		200.85		194.19
30.0	197.07		198.02		199.09		200.13		200.87		194.17
35.0	197.14		198.03		199.10		200.14		200.87		194.17
40.0	197.18		198.03		199.11		200.15		200.87		194.17
45.0	197.20		198.03		199.12		200.15		200.87		194.16
50.0	197.21		198.03		199.13		200.16		200.87		194.15
55.0	197.21		198.03		199.14		200.16		200.87		194.14
60.0	197.22		198.03		199.15		200.16		200.87		194.13
70.0	197.23		198.03		199.17		200.16		200.87		194.10
80.0	197.23		198.03		199.19		200.16		200.87		194.07
90.0	197.23		198.03		199.21	E E	200.16		200.87		194.05
100.0	197.24	ĺ	198.03		199.21		200.16		200.87		194.04
110.0	197.24		198.03		199.21		200.16		200.87		194.02
120.0	197.24		198.03		199.21		200.16		200.87		193.97
180.0	<u> </u>										193.88
240.0			1								193.85
300.0	•		i		_						193.83
420.0											193.80

# Constant Discharge & Recorery Test (1/2)

Well Code:	<u>S-07</u>	Site code:	<u>S-07</u>
Site name:	Bait Al Hadrami		
District:	Sanhan & Bany Bahlool		
Governorate:	Sana'a		

Abdulkhaleg M. AL- Goli Contractor: Hydrogeologist: Ali Abdullah Nagi AL- Gounaid Bulul

Operator:

Pump on date/hour:	2-8-2006-10:40pm
Pump off date/hour:	3-8-2006-10:40pm
End of recovery hour:	4-8-2006-3:40am

S.W.L ( m ):	193.80
D.W.L.(m):	197.70
Yield (l/sec):	3.2

Duranti au	Cons	tant Dischrge T	est	Recove	ry Test	Water Analysis	
Duration ( min )	Water level (m)	Drawdown (m)	Pumping rate (I/sec)	Water level (m)	Residual (m)	Conductivity ( )	Remarks
0.0	193.80	0.00		197.70	3.90		
0.5	196.23	2.43		196.78	2.98		
1.0	197.07	3.27	1	196.33	2.53		
1.5	197.21	3.41		195.88	2.08		
2.0	197.33	3.53		195.33	1.53		
2.5	197.41	3.61		195.08	1.28		
3.0	197.50	3.70		194.99	1.19		
3.5	197.51	3.71		194.91	1.11		
4.0	197.52	3.72		194.82	1.02		
4.5	197.52	3.72		194.73	0.93		
5.0	197.53	3.73		194.66	0.86		
6.0	197.53	3.73		194.58	0.78		
7.0	197.54	3.74		194.51	0.71		
8.0	197.54	3.74		194.23	0.43		
9.0	197.54	3.74		194.12	0.32		
10.0	197.55	3.75		194.05	0.25		
12.0	197.55	3.75		194.02	0.22		
14.0	197.55	3.75		193.99	0.19		
16.0	197.55	3.75		193.98	0.18		
18.0	197.55	3.75		193.97	0.17		
20.0	197.55	3.75		193.96	0,16		
25.0	197.55	3.75		193.94	0.14		
30.0	197.55	3.75		193.92	0.12		
35.0	197.55	3.75		193.91	0.11		
40.0	197.55	3.75		193.90	0.10		
45.0	197.55	3.75		193.88	0.08		
50.0	197.55	3.75		193.87	0.07		
55.0	197.55	3.75		193.86	0.06		
60.0	197.55	3.75		193.85	0.05		

## Constant Discharge & Recorery Test (2/2)

S-07

Well	Code:
Distr	ict:

S-07 Site code:

Site name: Bait Al Hadrami

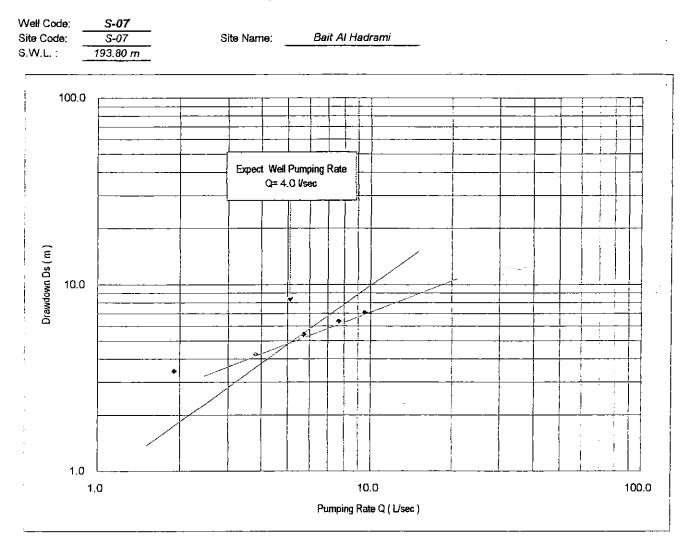
Sanhan & Bany Bahlool

Governorate: Sana'a

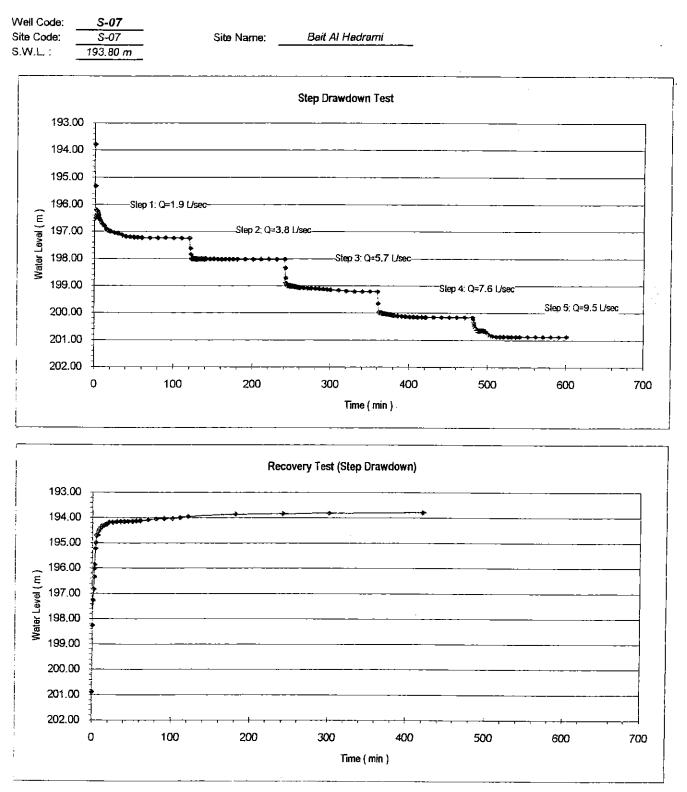
Duration -	Cons	tant Dischrge Te	est	Recove	ery Test	Water Analysis	
(min)	Water level (m)	Drawdown (m)	Pumping rate (l/sec)	Water level (m)	Residual (m)	Conductivity	Remarks
70.0	197 55	3.75		193.84	0.04		
80.0	197.56	3.76		193.84	0.04		
90.0	197.56	3.76		193.83	0.03		
100.0	197.56	3.76		193.83	0.03		
110.0	197.57	3.77		193.83	0.03		
120.0	197.57	3.77		193.82	0.02		
140.0	197.57	3.77		193.82	0.02		
160.0	197.58	3.78		193.81	0.01		
180.0	197.58	3.78		193.81	0.01		
200.0	197.59	3.79		193.81	0.01		
220.0	197.59	3.79		193.80	0.00		
240.0	197.59	3.79		193.80	0.00		
280.0	197.60	3.80		193.80	0.00		
320.0	197.62	3.82	-	193.80	0.00		
360.0	197.63	3.83					
420.0	197.65	3.85					
480.0	197.67	3.87					
540.0	197.68	3.88		<u> </u>			
600.0	197.68	3.88					
660.0	197.70	3.90					
720.0	197.70	3.90					
840.0	197.70	3.90					
960,0	197.70	3.90					
1080.0	197.70	3.90					-
1200.0	197.70	3.90					
1320.0	197.70	3.90					
14-40.0	197.70	3.90					

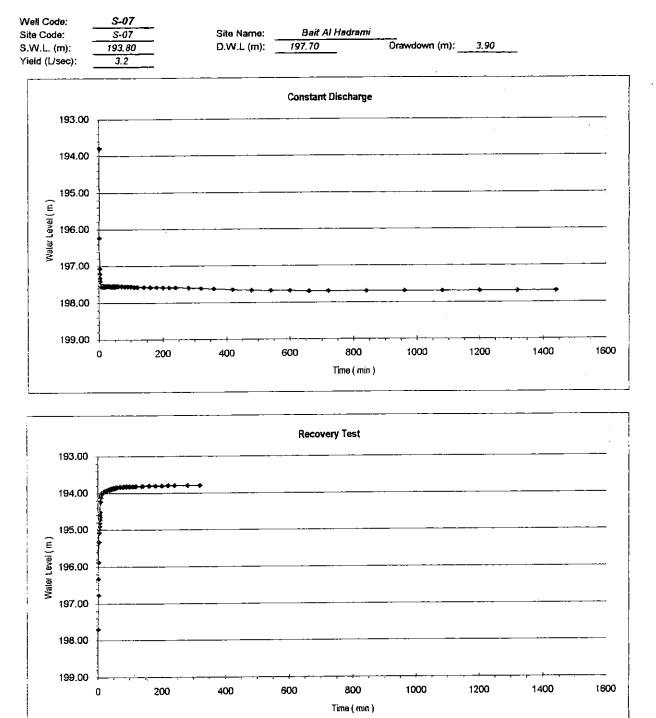
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Step	Q(I/sec) D.W.L.(m		Ds(m)
1	1.9	197.24	3.44
2	3.8	198.03	4.23
3	5.7	199.21	5,41
4	7.6	200.16	6.36
5	9.5	200,87	7.07





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#### **Constant Dischrge Test**

 $14 \cdot 256$ 

# Pumping Test Report Sheet

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Well code:	S-09	Site code:	S-09	Site name		Ruhm	<u> </u>
District:	Sanhan	& Bany Bahlool		Governo	orate:	Sana'a	
Target water	r source:	New projected	deep well	. <u></u>	Well depth:	470 m	
Contractor:		Abdulkhaleg	M. AL- G	oli			
Hydrogeologi	st in charge:	Ali Abdu	llah Nagi /	AL- Gounaid			
Operator:		Mohmme	d Azeen				
	Ve	21/8/2006 rtical pump		Date of end of Engine:		23/8/20	
Pump installa	ition depth:	290 m	<u> </u>	Datum level:	0.65 M	5.VV.L	G.L192.45 m
Step drawdo	own test						
		-8-2006-7:30pm					al hours: <u>17:30</u>
Yield (l/sec):	1 <sup>st</sup> step	0 2 <sup>nd</sup> step 2	2.00 3 <sup>rd</sup>	step <u>3.00</u>	_4 <sup>th</sup> step4.(	<u>00</u> 5 <sup>th</sup> step	5.00
Water level b	efore start the	test (G.Lm):	19	2.45			
Water level a	fter end of 5 <sup>th</sup> :	step (G.Lm):	25	3.58			
Water level a	fter recovery (	G.Lm):	19	2.45	Recovery hor	urs: <u>7:30</u>	<u> </u>
	scharge test	9 2006 2:05cm	Data#	our finished:	22 8 2006 1	0:05pm Tot	al hours: 31:00
Date/hour sta		-8-2006-3:05pm			23-0-2000-1	0.0000000000000000000000000000000000000	1110013. <u>01.00</u>
Yield (l/sec):	3.00 fore start of the	test (G L -m):	19	2.45			
	fter end of test			7.90			
	fter recovery (	-	·	2.45	Recovery hou	urs: 7:00	
Drawdown (m					,	- <u>-</u>	
Revised by:	,,, <u> </u>						
- Name :						2.	

Date:

### **Provisional Step Drawdown Test**

Well Code:	<u>\$-09</u>	Site code:	S-09
Site name:	Ruhm	· · ·	-
District:	Sanhan & Bany E	ahlool	_
Governorate:	Sana'a		_

 Pump on date/hour:
 21-8-2006-9:00am

 Pump off date/hour:
 21-8-2006-11:30am

 End of recovery hour:
 21-8-2006-7:20pm

 S.W.L (m):
 192.50

Contractor: <u>Abdulkhaleg M. AL- Goli</u> Hydrogeologist: <u>Ali Abdullah Nagi AL- Gounaid</u>

Operator: Mohmmed Azeen

[]	1st S	Step	2nd \$	Step	3rd S	Step	4th	Step	5th S	Step	
Duration	W.L.	Yield	W.L.	Yield	W.L.	Yield	W.L.	Yield	W.L.	Yield	Recovery (m)
( min )	(m)	(I/sec)	(m)	( l/sec)	(m)	( 1/sec)	( m )	(I/sec)	(m)	( 1/sec)	( <i>)</i>
0.0	192.50	1.00	199.68	2.00	202.83	3.00	209.23	4.00	218.34	5.00	233.56
0.5	194.27		199.71		203.09		209.92		218.60		227.09
1.0	195.36		199.79		204.04		210.47		219.06		222.10
1.5	196.27		200.03		204.60		210.66		219.48	-	217.77 🔅
2.0	196.93		200.47		205.08		211.67		220.01		216.13
2.5	197.28		200.68		205.49		211.99		220.63		213.66
3.0	197.94		200.77		205.58		212.12		221.13		212.57
3.5	198.09		200.84		205.81		212.47		221.43		211.01
4.0	198.23		200.86		205.94		212.88		221.74		210.33
4.5	198.36		200.91		206.00		213.17		222.72		209.87
5.0	198.49		200.92		206.18		213.86		223.83		209.42
6.0	198.62		200.93		206.27		214.17		224.23		208.00
7.0	198.73		201.04		206.51		214.23		225.99		207.12
8.0	198.86		201.27		206.77		214.29		226.30		206.11
9.0	198.94		201.45		206.89		214.87		226.81		205.13
10.0	199.16		201.84		207.18		215.07		227.64		203.87
12.0	199.37		202.09		207.29		215.82		228.77		201.37
14.0	199.37		202.38		207.31		216.48		229.69		200.23
16.0	199.37		202.41		207.41		216.97		230.53		199.37
18.0	199.37		202.43		207.52		217.32		231.23		199.02
20.0	199.41		202.44		207.68		217.88		231.79		198.83
22.0	199.52		202.46		208.01		218.09		232.28		198.65
24.0	199.63		202.48		208.61		218.11		232.69		198.27
26.0	199.68		202.51		208.98		218.19		232,98		197.83
28.0	199.68		202.67		209.13		218.27		233.27		197.63
30.0	199.68		202.83		209.23		218.34		233.56		197.42
50.0											197.01
55.0											196.74
60.0											196.13
70.0											195.37
80.0									<u></u>		194,77
90.0							<u> </u>				197.22
100.0											194.07
110.0	·										193.41
120.0								-			193.27
140.0											193.23
160.0											193.20
180.0											193.17
200.0											193.10
220.0	:								i		193.13

### Provisional Step Drawdown Test (2/2)

Well Code:	<u> </u>	Site code:	S-09
Site name:	Ruhm	<u>.</u>	
District:	Sanhan & Bany Bahlo	bol	
Governorate:	Sana'a		

Contractor: <u>Abdulkhaleg M. AL- Goli</u>

Hydrogeologist: Ali Abdullah Nagi AL- Gounaid

Operator: Mohmmed Azeen

1st Step		2nd Step		3rd Step		4th Step		5th Step			
Duration <sup>-</sup> ( min )	W.L. (m)	Yield ( l/sec)	W.L. (m)	Yield ( l/sec)	W.L. (m)	Yield ( l/sec)	W.L. (m)	Yield ( l/sec)	W.L. (m)	Yield ( I/sec)	Recovery (m)
240.0		· · · · · ·	<u> </u>					-			193.13
260.0											193.12
280.0				•		· · ·					193.12
300.0	·			<u></u>							193,11
320.0	<u> </u>	<u> </u>									193.11
350.0	<del></del>	<u> </u>									193.10
380.0											193.10
410.0			<b></b>						<u>.</u>		193.10
440.0		· · ·				·····					193.10
470.0	····										193.10
				-							
							<u> </u>			·	
										-	
			<u></u>								
	- <u>-</u>						-				
+											<u> </u>
	<u> </u>						•	-			
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					<u> </u>						<u>-</u>
			<u> </u>		· · · · ·		<u> </u>	·	<u> </u>		· ·
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	<u> </u>							<u>.                                    </u>			
								<u>.</u>			
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# Step Drawdown Test (1/2)

Well Code:	<u>S-09</u>	Site code:	<u> </u>
Site name:	Ruhm		_
District:	Sanhan & Bany E	Bahlool	_
Governorate:	Sana'a		_
			-

Pump on date/hour:	21-8-2006-7:30pm			
Pump off date/hour:	22-8-2006-5:30am			
End of recovery hour:	22-8-2006-3:00pm ·			
S.W.L ( m ):	193.10			

Contractor:	Abdulkhaleg M. AL- Goli	
Hydrogeologi	st: Ali Abdullah Nagi AL- Gounaid	
Operator:	Mohmmed Azeen	

Operator: <u>Mohmmed Azeen</u>

0	1st S	Step	2nd S	Step	3rd S	Step	4th Step	5th \$	Step	
Duration (min)	W.L. (m)	Yield (1/sec)	W.L. (m)	Yield ( l/sec)	W.L. (m)	Yield ( l/sec)	W.L. Yield (m) (l/sec)	W.L. (m)	Yield ( l/sec)	Recovery (m)
0,0	193.10			2.00	204.11	3.00		226.70	5.00	254.23
0.0	193.10	1.00	199.69 200.43	2.00	204.11	3.00	215.48 4.00 216.10	226.70	- 5,00	254.23
1.0	194.30		200.43		204.83		216.57	227.56		
1.5	195.63		200.04		204.92		217.00	228.47		246.10 241.57
2.0	195.87		200.92		205.25		217.00	229.08		237.11
2.5	196.02		201.04		206.11		217.93	229.42		234.22
3.0	196.15		201.24		206.36		218.32	230.53		231.73
3.5	196.23		201.39		206.84		218.57	230.97		229.03
4.0	196.38		201.48		207.09		219.20	231.48		228.90
4.5	196.49		201.61		207.44		219.68	232.07		228.01
5.0	196.62		201.85		207.62		219.92	232.44		227.29
6.0	196.85	· -·· - · ·	202.27		207.97		220.56	233.48		224.79
7.0	195.99		202.31		208.36		221.00	234.07	···	223.16
8.0	197.17		202.44		208.57		221.64	234.44		221.36
9.0	197.38		202.57		208.72		221.89	234.69	İ	219.47
10.0	197.58		202.63		208.98		222.23	234.70		217.39
12.0	197.69		202.70		209.36		222.77	234.89		214.94
14.0	197.79		202.82		209.97		223.34	235.00		212.41
16.0	197.87		202.84		210.43		223.63	237.03	· · · ·	210.21
18.0	197.92	1	202.93		210.82		223.87	238.16		207.83
20.0	197.98		202.97		211.02		224.02	239.10		206.17
25.0	198.01		203.00		211.29		224.41	241.33		202.21
30.0	198.04		203.12		211.62		224.52	243.12		199.47
35.0	198.06		203.15		211.76		224.60	244.88		198.13
40.0	198.07		203.17		211.97		224.63	244.97		197.27
45.0	198.07		203.18		212.32		224.67	245.09		196.53
50.0	198.07		203.20		212.44		224.71	246.64		196.33
55.0	198.07		203.23		212.63		224.73	247.61		196.05
60.0	198.11		203.27		212.94		224.75	248.69		195.89
70.0	198.37		203.31		213.11	Î	224.78	249.69		195.51
80.0	198.47		203.47		213.23		224.81	250.53		195.13
90.0	198.73		203.74		213.49		224.84	251.37		194.93
100.0	199.47		204.03		213.82		225.38	252.41		194.72
110.0	199.49		204.08		214.74		225.87	253.39		194.55
120.0	199.96		204.11		215.48		226.70	254.23		194.47
130.0										194.17
140.0			:							193.76
150.0	,									193.45
160.0										193.31
170.0				. 1				é .		193.27

Step	Drawdown	Test	(2/2)
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Well Code:	S-	.09	Site co	ode:	S-09	_	Site name:	Ruhm			
District:		an & Bany .				Go	overnorate:	Sana'a			
									·		
	1st	Step	2nd	Step	3rd	Step	4th	Step	5th	Step	
Duration -	W.L. (m)	Yield ( I/sec)	W.L. (m)	Yield (I/sec)	W.L. (m)	Yield ( l/sec)	W.L. (m)	Yield ( l/sec)	W.L. (m)		Recovery (m)
180,0					-				+- <u></u>		193.24
200.0											193.18
220.0				· · ·				-		·	193.16
240.0				·			1				193.15
260.0		··-			· · ·						193.14
280.0			· · · ·					<u> </u>	1		193.13
300.0	<u>.</u> .						1				193.13
320.0							1				193.12
340.0		·		<u> </u>		_					193.12 🧃
360.0						<u></u>			-		193.12
380.0						-		· · · ·			193.11
400.0						· · ·		<u> </u>		·	193.11
430.0								··-			193.11
460.0					<u> </u>		1				193.10
490.0											193.10
520.0		· · · · · · · · · · · · · · · · · · ·									193.10
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### Constant Discharge & Recorery Test (1/2)

Well Code:	<u>S-09</u>	Site code:	S-09
Site name:	Ruhm		
District:	Sanhan & Bany Bahlool		
Governorate:	Sana'a		

 Contractor:
 Abdulkhaleg M. AL- Goli

 Hydrogeologist:
 Ali Abdullah Nagi AL- Gounaid

 Operator:
 Mohrnmed Azeen

 Pump on date/hour:
 22-8-2006-3:05pm

 Pump off date/hour:
 23-8-2006-3:05pm

 End of recovery hour:
 23-8-2006-10:05pm

S.W.L ( m ): _	193.10
D.W.L ( m ):	228.55
Yield (l/sec):	3.0

Duration Con		Constant Dischrge Test			ry Test	Water Analysis	
(min)	Water level (m)	Drawdown (m)	Pumping rate (l/sec)	Water level (m)	Residual (m)	Conductivity ()	Remarks
0.0	193.10	0.00		228.55	35.45		f
0.5	198.00	4.90		223.61	30.51		
1.0	198.92	5.82		220.56	27.46	·	
1.5	199.51	6.41		218.77	25.67		
2.0	200.27	7.17		217.00	23.90		
2.5	201.36	8.26		215.04	21.94	1	-
3.0	202.29	9.19		214.18	21.08		
3.5	203.04	9.94		213.33	20.23	1	
4.0	203.62	10.52		212.22	19.12		
4.5	204.19	11.09	1 1	211.99	18.89		
5.0	204.73	11.63		211.31	18.21		
6.0	205.51	12.41		211.79	18.69		
7.0	206.41	13.31		210.23	17.13		
8.0	207.38	14.28		210.18	17.08		
9.0	207.99	14.89		209.98	16.88		
10.0	208.67	15.57		209.66	16.56		
12.0	209.88	16.78		209.17	16.07		
14.0	210.67	17.57		208.63	15.53		<u></u>
16.0	211.92	18.82		207.91	14.81		·
18.0	212.09	18.99		206.06	12.96		
20.0	212.70	19.60		205.69	12.59		
25.0	213.59	20.49		204.53	11.43		
30.0	214.01	20.91		203.65	10.55		
35.0	214.55	21.45		203.03	9,93		
40.0	215.06	21.96	· · · · · · · · · · · · · · · · · · ·	202.88	9.78		
45.0	215.54	22.44		201.28	8.18		
50.0	216.07	22.97		200.99	7.89		
55.0	217.03	23.93		199.59	6.49		
60.0	217.43	24.33		198.17	5.07		

## Constant Discharge & Recorery Test (2/2)

Well	Code:
Distri	ict-

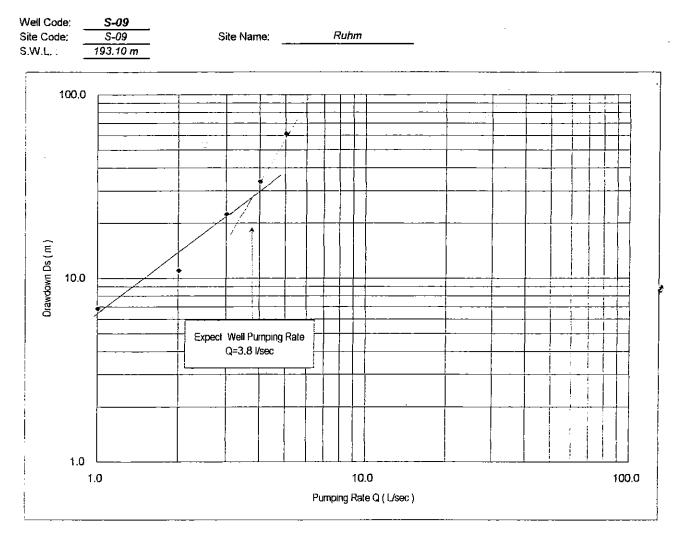
Sanhan & Bany Bahlool

Site code: <u>S-09</u>

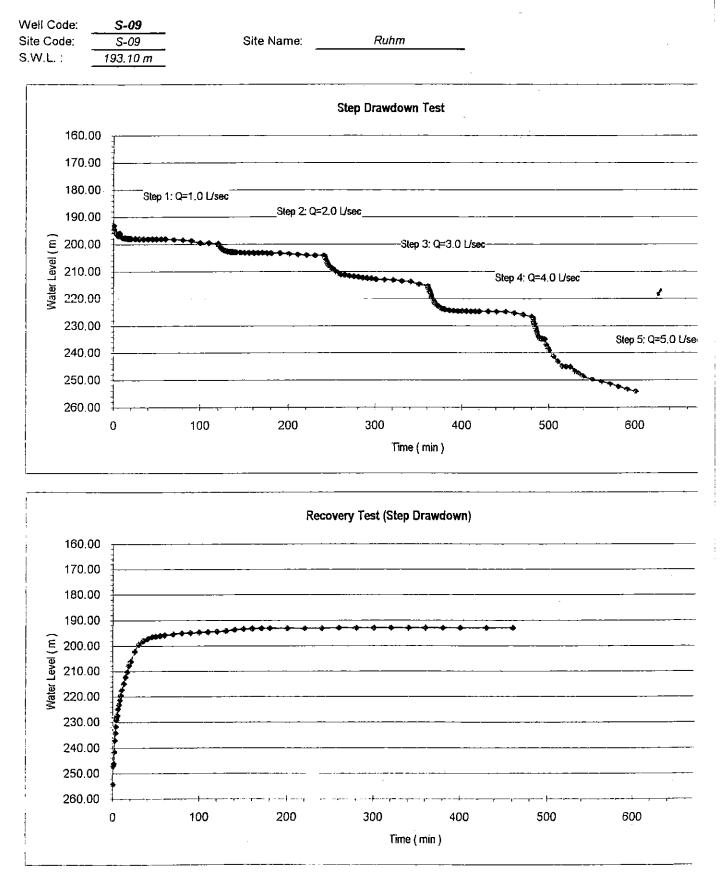
Site name: <u>Ruhm</u>

Governorate: Sana'a

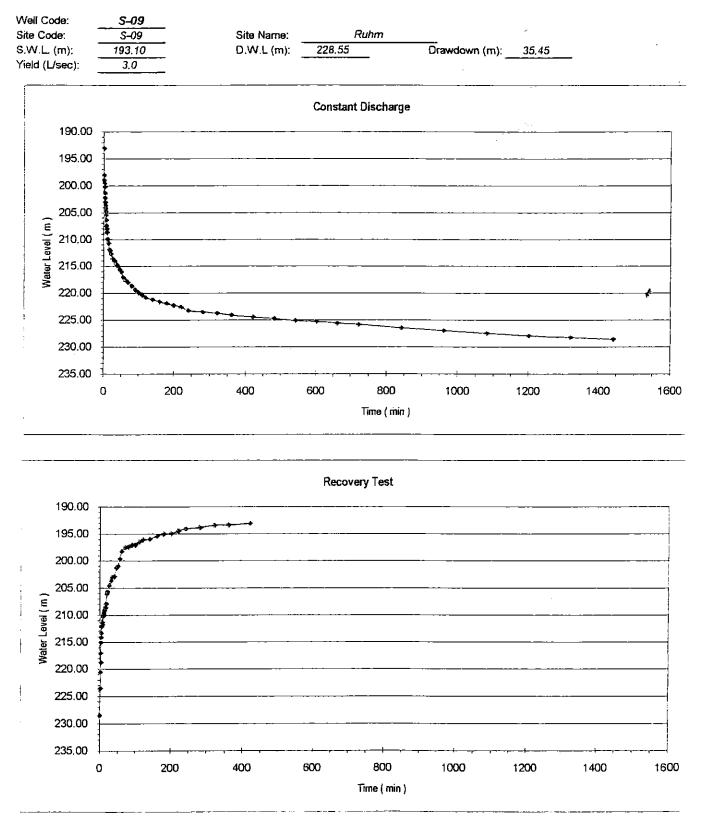
Duration	Constant Dischrg		est	Recove	ery Test	Water Analysis	
Duration ( min )	Water level (m)	Drawdown (m)	Pumping rate (l/sec)	Water level (m)	Residual (m)	Conductivity ()	Remarks
70.0	217.93	24.83		197.47	4.37		
80.0	218.67	25.57		197.38	4.28		
90.0	219.39	26.29	· ·	197.01	3.91		
100.0	219.92	26.82		196.98	3.88		
110.0	220.31	27.21		196.40	3.30		<u> </u>
120.0	220.79	27.69		196.03	2.93		
140.0	221.19	28.09		195.99	2.89		
160.0	221.56	28.46		195.41	2.31		
180.0	221.91	28.81		195.05	1.95		
200.0	222.24	29.14		194.98	1.88		
220.0	222.55	29.45		194.45	1.35		
240.0	223.17	30.07		194.08	0.98		
280.0	223.48	30.38	i -	193.88	0.78		
320.0	223.73	30.63		193.46	0.36		
360.0	224.09	30.99		193.37	0.27		
420.0	224.43	31.33		193.10	0.00		
480.0	224.73	31.63					
540.0	225.12	32.02					
600.0	225.30	32.20					
660.0	225.58	32.48					
720.0	225.84	32.74					
840.0	226.46	33.36					
960.0	226.98	33.88					
1080.0	227.45	34.35					
1200.0	227.88	34.78					
1320.0	228.23	35.13					
1440.0	228.55	35.45					
							- —



Step	Q (1/sec)	D.W.L.(m)	Ds(m)
1	1.0	199.96	6.86
2	2.0	204.11	11.01
3	3.0	215.48	22.38
4	4.0	226.70	33.60
5	5.0	254.23	61.13



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### **Constant Dischrge Test**

# Pumping Test Report Sheet

·
Well code: S-10/1 Site code: S-10 Site name: Tawa'ar
District: <u>Al Hesn</u> Governorate: <u>Sana'a</u>
Target water source: Existing projected deep well Well depth: 280 m
Contractor: Abdulkhaleg M. AL- Goli
Hydrogeologist in charge: Ali Abdullah Nagi AL- Gounaid
Operator: Mohammed Azeen
Date of start of the test: <u>15/8/2006</u> Date of end of the test: <u>18/8/2006</u>
Pump type: Vertical pump Engine: Iveco aifo
Pump installation depth: 220 m Datum level: 0.62 m S.W.L.: G.L134.78 m
Step drawdown test
Date/hour started: <u>16-8-2006-2:00am</u> Date/hour finished: <u>17-8-2006-12:35am</u> Total hours: <u>22:35</u>
Yield (I/sec): 1 <sup>st</sup> step 0.90 2 <sup>nd</sup> step 1.80 3 <sup>rd</sup> step 2.70 4 <sup>th</sup> step 3.60 5 <sup>th</sup> step 4.50
Water level before start the test (G.Lm): <u>134.78</u>
Water level after end of 5 <sup>th</sup> step (G.Lm): <u>201.32</u>
Water level after recovery (G.Lm): <u>134.78</u> Recovery hours: <u>12:35</u>
Constant discharge test
Date/hour started: <u>17-8-2006-12:40am</u> Date/hour finished: <u>18-8-2006-4:40pm</u> Total hours: <u>28:00</u>
Yield (I/sec): <u>3.80</u>
Water level before start of the test (G.Lm): 134.78
Water level after end of test (G.Lm): <u>180.62</u>
Water level after recovery (G.Lm): <u>134.78</u> Recovery hours: <u>4:00</u>
Drawdown (m): 45.84
Revised by:
Name :

Date:

### Provisional Step Drawdown Test (1/2)

Well Code:	<u>S-10/1</u>	Site code:	S-10
Site name:	Tawa'ar		
District:	Al Hesn		
Governorate:	Sana'a		

Pump on date/hour:	15-8-2006-3:30pm
Pump off date/hour:	15-8-2006-6:00pm
End of recovery hour:	16-8-2006-1:40am
S.W.L ( m ):	135.40

 Contractor:
 Abdulkhaleg M. AL- Goli

 Hydrogeologist:
 Ali Abdullah Nagi AL- Gounaid

 Operator:
 Mohammed Azeen

Duran Hin	1st \$	Step	2nd	Step	3rd S	Step	4th S	Step	5th	Step	
Duration (min)	W.L. (m)	Yield ( l/sec)	W.L. (m)	Yield ( l/sec)	W.L. (m)	Yield ( l/sec)	W.L. (m)	Yield ( l/sec)	W.L. (m)	Yield ( l/sec)	Recovery (m)
0.0	135.40	0.90	141.10	1.80	149.25	2.70	161.91	3.60	175.24	4.50	187.25
0.5	137.41		141.90		150.12		162.53		176.82		182.03
1.0	137.45		142.47		151.14		163.42		176.98	1	178.52
1.5	137.47		142.92		151.67		163.51		177.07		176.78
2.0	137.49		143.14		151.97		163.73		177.05		175.47
2.5	137.52		143.45		152.15		164.21		177.37		174.56
3.0	137.60		143.80		152.44		164.82		177.69		174.27
3.5	137.63		144.07		152.91		165.19		178.07		174.09
4.0	137.71 .		144.29		153.34	Ì	165.52	-	178.24		173.87
4.5	137.75		144.41		153.66		165.70		178.55		173.62
5.0	137.80		144.63		153.98		166.17		179.04		173,31
6.0	138.02		144.92		154.55		166.72		179.45	1	172.73
7.0	138.14		145.21		154.93		167.40		179.79		172.02
8.0	138.35		145.35		155.41		167.96		180.17		171.42
9.0	138.52		145.51		155.99		168.33		180.52	İ	170.81
10.0	138.60		145.73		156.62		168.92		180.93		170.24
12.0	138.87		146.05		157.23		169.55		181.67	P	169.03
14.0	139.07		146.78		158.05		170.60		182.32		167.94
16.0	139.14		147.35		158.51		171.85		183.05		166.92
18.0	139.23		147.80		159.09		172.34		183.64		165.85
20.0	139.29		148.33		159.59		172.88		185.02		164.96
22.0	139.50		148.55		159.87		173.39		185.57		163.22
24.0	139.57		148.64		160.23		173.82	- 1	186.14		163.01
26.0	140.69		148.87		160.92		174.35		186.55		162.50
28.0	140.90		149.02		161.43		174.97		186.97		161.79
30.0	141.10		149.25		161.91		175.24		187.25		161.00
35.0	-										159.21
40.0					•						158.07
45.0			··· · ·								156.72
50.0									·		155.50
60.0											153.23
70.0					•					· · · · · · · · · · · · · · · · · · ·	151.19
80.0											149.78
90.0									· · · · · · · · · · · · · · · · · · ·		148.39
100.0											147.61
120.0							· · ·				146.27
130.0		İ									145.25
140.0			· · · · · · · · · · · · · · · · · · ·					<u> </u> _			144.30
150.0	i						· · · · ·				143.36
170.0			!						•	·	142.44

## Provisional Step Drawdown Test (2/2)

Well Code:	<u>S-10/1</u>	Site code:	<u>S-10</u>	Pump on date/hour:	
Site name:	Tawa'ar			Pump off date/hour:	
District:	Al Hesn			End of recovery hour:	
Governorate:	Sana'a			S.W.L ( m ):	

Contractor: Abdulkhaleg M. AL- Goli

Hydrogeologist: Ali Abdullah Nagi AL- Gounaid

Operator: Mohammed Azeen

	1st	Step	2nd	Step	3rd	Step	4th Step		5th	Step	<b>.</b>
Duration (min)	W.L. (m)	Yield ( l/sec)	W.L. (m)	Yield (I/sec)	W.L. (m)	Yield ( l/sec)	W.L. (m)	Yield (I/sec)	W.L. (m)	Yield ( l/sec)	Recovery (m)
190.0											141.52
210.0			<u></u> -	_		· · .	. <u> </u>				140.72
220.0											139.92
240.0									··		139.14
260.0											137.94
280.0											136.86
300.0											135.94
320.0											135.64
340.0											135.45
360.0											135.40
380.0											135.40
400.0											135.40
420.0											135.40
440.0					· - <u>-</u> -						135.40
460.0					•						135.40
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# Step Drawdown Test (1/2)

Well Code:	S-10/1	Site code:	S-10
Site name:	Tawa'ar		
District:	Al Hesn		
Governorate:	Sana'a		

Pump on date/hour:	16-8-2006-2:00am
Pump off date/hour:	16-8-2006-12:00pm
End of recovery hour:	17-8-2006-12:35am
S.W.L ( m ):	135.40

Contractor:	Abdulkhaleg M. AL- Goli	_
Hydrogeologi	st: Ali Abdullah Nagi AL- Gounaid	_
Operator	Mohammed Azeen	

Operator: <u>Mohammed Azeer</u>

	1st S	Step	2nd \$	Step	3rd \$	Step	4th Step		5th Step		Decourse	
Duration (min)	W.L.	Yield	W.L.	Yield	W.L.	Yield	W.L.	Yield	W.Ĺ.	Yield	Recovery (m)	
	(m)	(I/sec)	(m)	(I/sec)	(m)	(l/sec)	(m)	(l/sec)	(m)	( l/sec)		
0.0	135.40	0.90	146.95	1.80	160.45	2.70	179.40	3.60	190.94	4.50	201.94	
0.5	136.03		148,19		161.77		180.04		191.04		196.01	
1.0	136.73		148.65		162.80		180.08		191.45		193.98	
1.5	136.98		148.95		163.11		180.13		191.85		191.72	
2.0	137.38		149.10		163.52		180.18		191.97		191.09	
2.5	137.51		149.27		163.79		180.22		192.11		190.18	
3.0	137.65		149.49		163.95		180.31		192.45		189.77	
3.5	137.74		149.57		164.27		180.37		192.45		189.65	
4.0	137.82		149.66		164.60		181.14		192.80		189.60	
4.5	137.93		149.75		164.94		181.40		193.14		189.38	
5.0	137.97		149.84		165.22		1 <b>81</b> .68		193.37		189.26	
6.0	138.03		149.93		165.55		182.03		193.94		189.11	
7.0	138.08		150.17		165.91		182.43	-	194.12		188.55	
8.0	138.09		150.42		166.14		182.75		194.35		188.08	
9.0	138.18		150.52		166.45		182.93		194.81		187.32	
10.0	138.33		150.63		166.76		183.52		194.99		186.93	
12.0	138,67	^	150.95		167.23		183.94		195.44		186.03	
14.0	139.13		151.12		167.55		184.32		195.76		185.12	
16.0	139.35		151.14		167.96		184.80		195.89		184.32	
18.0	139.57		151.37		168.31		185.10		196.34		183.52	
20.0	139.73		151.74		168.56		185.27		196.65		182.77	
25.0	140.03		152.85		169.07		185.73		197.69		180.97	
30.0	140.42		153,12		169.79		186.26		197.98	_	179.22	
35.0	140.67		154.24		171.10		186.95	_	198.14		177.80	
40.0	141.17		155.12		171.63		187.14		198.44		176.39	
45.0	141.55		156.54		172.37		187.23		199.80		175.23	
50.0	141.93		157.04		173.35		187.85		200.24		174.20	
55.0	142.13		157.35		173.94		188.02		200.57		173.17	
60.0	143.07		157.53		174.62		188.43		200.88		172.28	
70.0	145.30		157.92	†	175.26		188.95		201.12		170.72	
80.0	146.30		158.64		176.04		189.03		201.34		169.42	
90.0	146.42		159.43		177.02		189.85		201.40		168.03	
100.0	146,56		159.97	†	177.75		189.92		201.60		166.04	
110.0	146.77		160.42		178.48	†	190.45		201.85		164.80	
120.0	146.95		160.45	[	179.40		190.94		201.94		163.39	
140.0						†			<u> </u>		162.24	
160.0			<del>_</del>					····-			161.41	
180.0	~·										160.57	
200.0							-		<u> </u>	†	159.74	
220.0			;			<b></b>		l.			158.92	

Step	Drawdown	Test	(2/2)
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Well Code:			Site code: <u>S-10</u> Site name: <u>Tawa'ar</u>								
District:	<u>Al He</u>	sn	Governorate: Sana'a								
	1st	Step	2nd	Step	3rd Step		4th Step		5th Step		
Duration - (min)	W.L. (m)	Yield ( l/sec)	W.L. (m)	Yield ( l/sec)	W.L. (m)	Yield ( l/sec)	W <u>L</u> (m)	Yield ( l/sec)	W.L. (m)	Yield ( l/sec)	Recov (m
240.0	<u></u>					<del>_</del>					156.4
260.0	·										154.8
280.0	<u> </u>										153.3
320.0							_				150.2
350.0											148.0
380.0											145.7
410.0											144.9
450.0				_							143.1
505.0									/		139.8
545.0											137.5
585.0											135.7
625.0						<u> </u>	<u> </u>				135.4
665.0				<u>_</u>							135.4
705.0										<u>.</u>	135.4
755.0											135.4
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# Constant Discharge & Recorery Test (1/2)

Well Code:	S-10/1	Site code:	S-10
Site name:	Tawa'ar		
District:	Al Hesn		
Governorate:	Sana'a		

Contractor: <u>Abdulkhaleg M. AL- Goli</u> Hydrogeologist: <u>Ali Abdullah Nagi AL- Gounaid</u> Operator: <u>Mohammed Azeen</u>

Pump on date/hour:	17-8-2006-12:40am
Pump off date/hour:	18-8-2006-12:40am
End of recovery hour:	18-8-2006-4:40pm

S.W.L ( m ):	135.40	
D.W.L ( m ):	181.24	
Yield (l/sec):	2.2	

Co		tant Dischrge Te	est	Recove	ery Test	Water Analysis		
Duration - (min)	Water level (m)	Drawdown (m)	Pumping rate (I/sec)	Water level (m)	Residual (m)	Conductivity ()	Remarks	
0.0	135.40	0.00		181.24	45.84			
0.5	137.47	2.07		175.33	39.93			
1.0	138.12	2.72		172.93	37.53			
1.5	138.65	3.25		170.53	35.13	· ·		
2.0	138.94	3.54		168.03	32.63			
2.5	139.44	4.04		166.92	31.52			
3.0	139.64	4.24		164.89	29.49			
3.5	140.17	4.77		163.71	28.31			
4.0	140.23	4.83		162.68	27.28			
4.5	140.53	5.13		161.71	26.31			
5.0	140.70	5.30		160.67	25.27			
6.0	141.02	5.62		159.83	24.43			
7.0	141.37	5.97		158.71	23.31			
8.0	141.78	6.38		157.69	22.29			
9.0	141.92	6.52		156.72	21.32			
10.0	142.32	6.92		155.81	20.41			
12.0	143.61	8.21		154.63	19.23			
14.0	144.53	9.13		153.59	18.19			
16.0	145.02	9.62		152.61	17.21			
18.0	145.62	10.22		151.57	16.17	-	-	
20.0	145.92	10.52		150.60	15.20	<u> </u>		
25.0	148.23	12.83		149.73	14.33	1 -1		
30.0	151.12	15.72		148.72	13.32			
35.0	151.61	16.21		147.71	12.31	1		
40.0	151.97	16.57		145.69	10.29			
45.0	152.83	17.43		143.68	8.28			
50.0	153.52	18.12		141.78	6.38		<del></del>	
55.0	154.35	18.95		139.67	4.27			
60.0	154.64	19.24		138.66	3.26		<u> </u>	

## Constant Discharge & Recorery Test (2/2)

Well Code: District: S-10/1

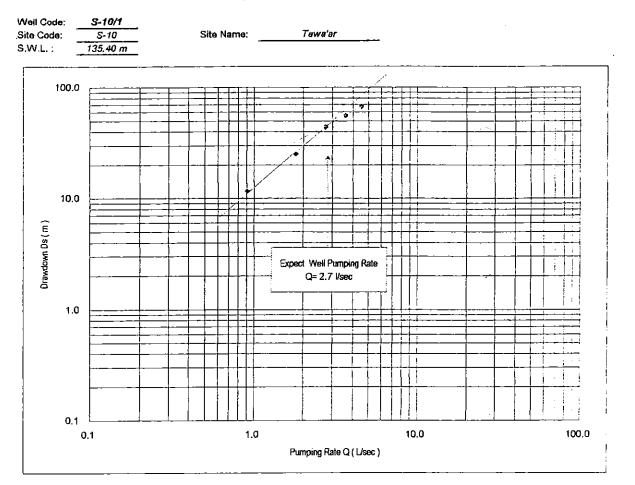
Al Hesn

Site code: <u>S-10</u>

Site name: <u>Tawa'ar</u>

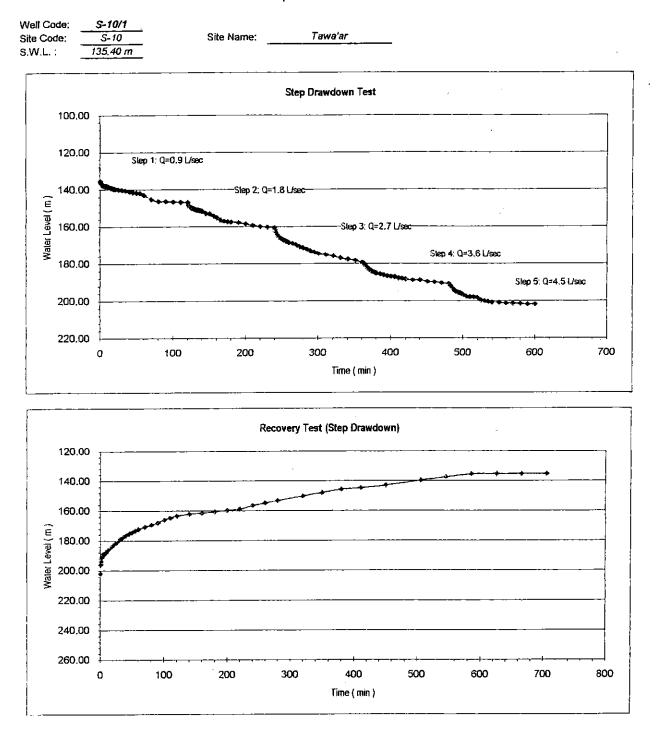
Governorate: Sana'a

Duration	Cons	tant Dischrge Te	est	Recove	ery Test	Water Analysis	
(min) Water level (m)		Drawdown Pumping (m) rate (l/sec)		Water level (m)	Residual (m)	Conductivity ( )	Remarks
70.0	155.46	20.06		137.92	2.52		
80.0	155.95	20.55		136.89	1.49		
90.0	156.77	21.37		135.95	0.55		
100.0	157.78	22.38		135.71	0.31		
110.0	158.43	23.03		135.66	0.26		
120.0	159.36	23.96		135.52	0.12		
140.0	160.64	25.24		135.45	0.05	1	
160.0	161.67	26.27		135.40	0.00		
180.0	162.53	27.13		135.40	0.00		
200.0	163.41	28.01	ĺ	135.40	0.00		
220.0	163.97	28.57		135.40	0.00		-
240.0	164.12	28.72		135.40	0.00		
280.0	164.55	29.15			··		
320.0	165.74	30.34				1	
360.0	166.73	31.33					
420.0	166.93	31.53	•••••			·	
480.0	167.24	31.84		2			
540.0	167.53	32.13					
600.0	167.82	32.42					
660.0	168.84	33.44			· · · · · · · · · · · · · · · · · · ·		
720.0	169.54	34.14			· ·		
840.0	169.80	34.40					
960.0	170.04	34.64			· · · · · · · · · · · · · · · · · · ·		
1080.0	173.68	38.28					
1200.0	177.40	42.00					
1320.0	179.38	43.98					
1440.0	181.24	45.84					
·							
i							

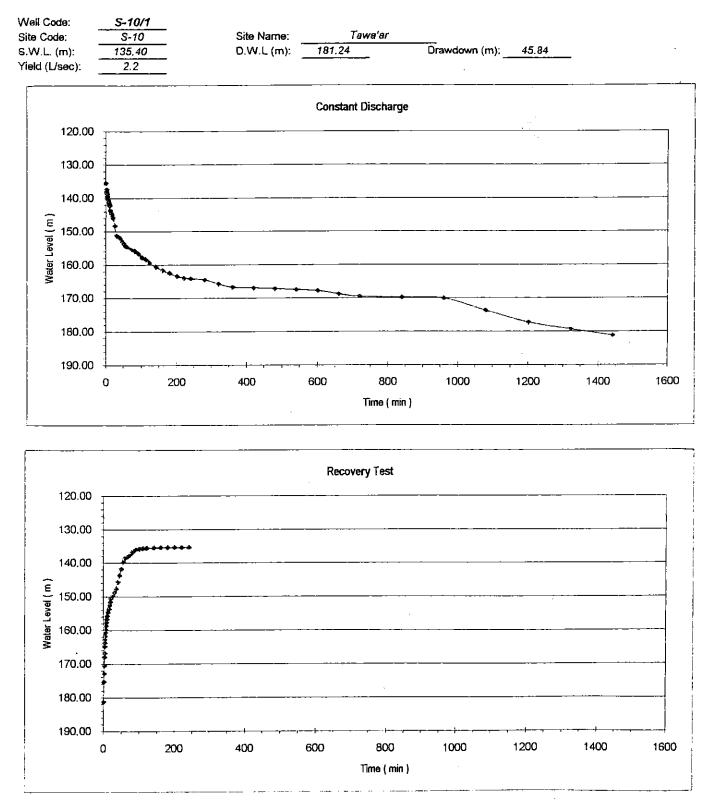


Slep	Q(I/sec)	0.W.L.(m)	Dis(mi)		
1	0.9	146.95	11,55		
2	1.8	160.45	25.05		
3	2.7	179.40	44.00		
4	3,6	190.94	55.54		
5	4.5	201.94	66,54		

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### **Constant Dischrge Test**



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# Pumping Test Report Sheet

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Well code: S-10/2 Site code:	S-10 Site пате:	Tawa'ar
District: Al Hesn	Governorate:	Sana'a
Target water source: <u>Existing projected of</u>	<u>deep well</u> Well dep	oth: <u>310 m</u>
Contractor: Abdulkhaleg M	1. AL- Goli	
Hydrogeologist in charge: Ali Abdulla	h Nagi AL- Gounaid	
Operator:Bulul	l	
Date of start of the test: <u>13/8/2006</u>	Date of end of the test:	16/8/2006
Pump type: Vertical pump	Engine:	lveco aifo
Pump installation depth: 220 m	Datum level: 0.53	<u>m</u> S.W.L.: <u>G.L144.74 m</u>
Step drawdown test		<b>—</b>
		006-10:20pm Total hours: <u>16:20</u>
Yield (l/sec): $1^{st}$ step <u>1.70</u> $2^{nd}$ step <u>3.4</u>		<u>6.70</u> 5" step <u>8.50</u>
• • •	160.27	
Water level after end of 5 <sup>th</sup> step (G.Lm):	<u>169.37</u>	y hours: 6:20
Water level after recovery (G.Lm):	144.83 Recover	y nours: 0.20
Constant discharge test	- · · · ·	
Date/hour started:         14-8-2006-10:30pm           Viold (l/pape)         2.80	Date/hour finished: <u>16-8-20</u>	006-6:30pm Total hours: 44:00
Yield (l/sec): <u>3.80</u>	<b></b>	
Water level before start of the test (G.Lm):	144.74	
Water level after end of test (G.Lm):	<u>155.96</u> 144.74 Recover	y hours: 20:00 ~
Water level after recovery (G.Lm):	<u>144.74</u> Recovery	y hours: <u>20.00</u>
Drawdown (m): <u>11.22</u>		
Revised by:		
Name :		·
Date:	<u> </u>	

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### Provisional Step Drawdown Test (1/2)

Well Code:	<u>S-10/2</u>	Site code:	<u>S-10</u>
Site name:	Tawa'ar		
District:	Al Hesn		
Governorate:	Sana'a		

Pump on date/hour:	13-8-2006-4;10pm
Pump off date/hour:	13-8-2006-6;40pm
End of recovery hour:	14-8-2006-1:00am
S.W.L ( m ):	145.27

Contractor: Abdulkhaleg M. AL- Goli

Hydrogeologist: Ali Abdullah Nagi AL- Gounaid

Operator: Bulul

<b>•</b> "			2nd	2nd Step 3rd Step			4th \$	Step	5th Step		<b>D</b>
Duration (min)	W.L. (m)	Yield (1/sec)	W.L. (m)	Yield ( l/sec)	W.L. (m)	Yield ( l/sec)	W.L. (m)	Yield (I/sec)	W.L. (m)	Yield (I/sec)	Recovery (m)
0.0	145.27	1.70	148.85	3.40	152.10	5.10	156.88	6.80	161.96	8.50	168.18
0.5	146.20		150.60		153.52		158.15		162.48		162.30
1.0	146.60		152.00		154.80		158.86		162.95		158.23
1.5	147.00		152.02		155.45		159.30		163.80		148.50
2.0	147.30		152,02		155.81		159,92		164.60		148.16
2.5	147.80		152.02		155.96		160.48		165.20		147.98
3.0	148.10		152.04		156.12	-	161.10		166.32	·····	147,64
3.5	148.24		52.05		156.21		161.36		167.20		147.28
4.0	148.35		152.07		156.36		161.60		167.55		146.90
4.5	148.52		152.07		156.38		161.70		167.65		146.62
5.0	148.58		152.07		156.40		161.78		167.73		146.18
6.0	148.60		152.07		156.50		161.85		167.93		145.33
7.0	148.64		152.07		156.58		161.87		168.05		145.27
8.0	148.65		152.07		156.60		161.87		168.08		145.33
9.0	148.67		152.08		156.63		161.87		168.10		14535
10.0	148.70		152.09		156.68		161.89		168.12		145.38
12.0	148.75		152.10		156.71		161.89		168.13		145.39
14.0	148.82		152.10		156.75		161.91		168.15		145.39
16.0	148.82		152.10		156.80		161.92		168.15		145.39
18.0	148.82		152.10		156.82		161.92		168.16		145.40
20.0	148.82		152.10		156.83		161.94		168.16		145.40
22.0	148.82		1 <b>52.1</b> 0		156.85		190.95		168.17		145.40
24.0	148.82		152.10		156.87		191.95		168.17		145.40
26.0	148.85		152.10	Î	156.88		161.95		168.18		145,40
28.0	148.85		152.10		156.88		161.96		168.18		145.40
30.0	148.85		152.10		156.88		161.96		168.18		145.39
50.0											145.39
55.0										•	145.38
60.0											145.38
70.0											145.37
80.0											145.36
90.0											145.36
100.0											145.36
110.0											145.36
120.0											145.36
140.0											145.36
160.0											145.36
180.0											145.36
200.0	·						:		5		145.36
220.0									1		145.36

## Provisional Step Drawdown Test (2/2)

Well Code:	S-10/2	Site code:	S-10	Pump on date/hour:	
Site name:	Tawa'ar		_	Pump off date/hour:	
District:	Al Hesn		_	End of recovery hour:	· ·
Governorate:	Sana'a	·	_	S.W.L ( m ):	

Contractor: <u>Abdulkhaleg M. AL- Goli</u> Hydrogeologist: <u>Ali Abdullah Nagi AL- Gounaid</u> Operator: <u>Bulul</u>

Duratian -		1st Step		2nd Step		3rd Step		4th Step		5th Step	
Duration (min)	W.L. (m)	Yield ( l/sec)	W.L. (m)	Yield ( l/sec)	W.L. (m)	Yield ( I/sec)	W.L. (m)	Yield (I/sec)	W.L. (m)	Yield ( I/sec)	Recovery (m)
240.0											145.37
260.0											145.36
280.0	· · ·										145.36
300.0							·				145.36
320.0						·		· · · · · · · · · · · · · · · · · · ·			145.36
340.0							-				145.36
360.0							1	i		-	145.36
380.0						• • • •					145,36
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Well Code:	<u>S-10/2</u>	Site code:	<u>S-10</u>
Site name:	Tawa'ar		
District:	Al Hesn	<u></u>	
Governorate:	Sana'a		

Pump on date/hour:	14-8-2006-6:00am
Pump off date/hour:	14-8-2006-4:00pm
End of recovery hour:	14-8-2006-10:20pm
S.W.L ( m ):	145.36

Contractor: <u>Abdulkhaleg M. AL- Goli</u> Hydrogeologist: <u>Ali Abdullah Nagi AL- Gounaid</u>

Operator: Bulul

<b>D</b>	1st S	Step	2nd	Step	3rd S	Step	4th S	Step	5th S	Step	
Duration (min)	W.L. (m)	Yield ( l/sec)	W.L. ' (m)	Yield ( l/sec)	W.L. (m)	Yield ( l/sec)	W.L. (m)	Yield ( l/sec)	W.L. (m)	Yield ( I/sec)	Recovery (m)
0.0	145.36	1.70	149.11	3.40	151.97	5.10	157.59	6.80	163.98	8.50	169.90
0.5	146.56		150.20		153.08		158.60		167.20		163.95
1.0	146.70		150.75		154.75		160.30		167.72		156.55
1.5	147.15		151.10		155.69		160.90		167.83		147.63
2.0	147.82		151.36		156.27	-	161.52		168.21		147.38
2.5	148.10		151.52		156.52		161.87		168.50		147.18
3.0	148.20		151.65		156.70		162.12		168.68		147.06
3.5	148.42		151.72		156.83		162.38		168.79		146.95
4.0	148.38		151.76		156.92		162.73		168.94		146.63
4.5	148.38		151.78		157.02		163.00		169.02		146.46
5.0	148.38		151.79		157.08		163.06		169.30		146.34
6.0	148.40		151.80		157.15		163.15		169.38		146.21
7.0	148.49		151.81		157.18		163.18		169.42		146.12
8.0	148.49		151.82		157.20		163.26		169.50		146.03
9.0	148.50		151.82		157,21		163.32		169.58		145.97
10.0	148.52		151.83		157.22		163.35		169.63		145.93
12.0	148.56		151.83		157.22		163.36		169.65		145.86
14.0	148.74		151.83		157.23		163.36	. –	169.66		145.70
16.0	148.82		151.84		157.26		163,37		169.67		145.66
18.0	148.82		151.84		157,31		163.37		169.68		145.61
20.0	148.82		151.84		157.38		163.38		169.69		145.57
25.0	148.82		151.85		157.45		163.38		169.70		145.52
30.0	148.82		151.85		157.46		163.38		169.71		145.48
35.0	148.82		151.86		157.47		163.39		169.71		145.45
40.0	148.82		151.87		157.48		163.39		169,71		145.42
45.0	148.82		151.88		157.49		163.39		169.72		145.39
50.0	148.82		151.89		157.50		163.40		169.72		145.37
55.0	148.82		151.90		157.50		163,40		169.74		145.36
60.0	148.82		151.91		157.52		163.45		169.74		145.36
70.0	148.92		151.92		157.55		163.58		169.80		145.36
80.0	149.05		151.94		157.58		163.71		169.82		145.37
90.0	149.05		151.95		157,58		163.90		169.82		145.37
100.0	149.06		151.96		157.58		163.92		169.84		145.37
110.0	149.08		151.96		157.59		163.95		169.86		145.38
120.0	149.11		151.97		157.59		163.98		169.90		145.38
140.0											145.38
160.0			!								145.37
180.0											145.37
200.0			1								145.37
220.0					i						145.37

Well Code: District:	S-1 Al Hes		Site c	ode:	S-10	- Go	Site name overnorate	: <u>Tawa'ar</u> : Sana'a			
	1st	Step	2nd	2nd Step 3rd Ste		Step	4th	Step	5th Step		
Duration - ( min )	W.L. (m)	Yield ( l/sec)	W.L. (m)	Yield ( I/sec)	W.L. (m)	Yield ( l/sec)	W.L. (m)	Yield (l/sec)	W.L. (m)	Yield ( l/sec)	Recovery (m)
240.0		<u> </u>				<b></b>			+ <b></b>	-	145.37
260.0							<u>-</u> -				145.36
280.0									-		145.36
300.0				-							145.36
320.0										••	145.36
340.0											145.36
360.0						<u>.</u>					145.36
380.0								<u> </u>			145.36
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### Constant Discharge & Recorery Test (1/2)

Well Code:	S-10/2	Site code:	S-10
Site name:	Tawa'ar		-
District:	Al Hesn		-
Governorate:	Sana'a	<u></u>	_

Contractor: Abdulkhaleg M. AL- Goli Hydrogeologist: Ali Abdullah Nagi AL-Gounaid Bulul

Operator:

Pump on date/hour: 14-8-2006-10:30pm Pump off date/hour: \_\_\_\_\_\_\_15-8-2006-10:30pm\_\_\_\_ End of recovery hour: <u>16-8-2006-6:30pm</u>

S.W.L ( m ): _	145.36
D.W.L ( m ):	156.49
Yield (I/sec):	4.1

	Cons	tant Dischrge Te	est	Recove	ry Test	Water Analysis	
Duration - ( min )	Water level (m)	Drawdown (m)	Pumping rate (I/sec)	Water level (m)	Residual (m)	Conductivity ( )	Remarks
0.0	145.36	0.00		156.49	11.13		-
0.5	149.42	4.06		153.33	7.97		
1.0	151.08	5.72		149.62	4.26		
1.5	152.80	7.44		148.23	2.87		
2.0	154.80	9.44		147.95	2.59		
2.5	155.12	9.76		147.53	2.17		
3.0	155.60	10.24		147.18	1.82		
3.5	155.83	10.47		147.05	1.69		
4.0	155.85	10.49		146.93	1.57		
4.5	155.86	10.50		146.84	1.48		
5.0	155.90	10.54		146.75	1.39		
6.0	155.90	10.54	-	146.53	1.17		
7.0	155.90	10.54		146.36	1.00		
8.0	155.95	10.59		146.23	0.87		
9.0	156.00	10.64		146.13	0.77		
10.0	156.00	10.64		146.04	0.68		
12.0	156.04	10.68		145.92	0.56		
14.0	156.05	10.69		145.83	0.47		
16.0	156.05	10.69		145.76	0.40		
18.0	156.07	10.71		145.66	0.30		
20.0	156.09	10.73		145.60	0.24		
25.0	156.23	10.87		145.56	0.20		
30.0	156.26	10.90		145.52	0.16		
35.0	156.32	10.96		145.48	0.12		
40.0	156.34	10.98		145.47	0.11		
45.0	156.37	11.01		145.47	0.11		
50.0	156.38	11.02		145,47	0.11		
55.0	156.38	11.02		145.46	0.10		
60.0	156.38	11.02		145.46	0.10		

## Constant Discharge & Recorery Test (2/2)

S-10

Well Code: District: S-10/2

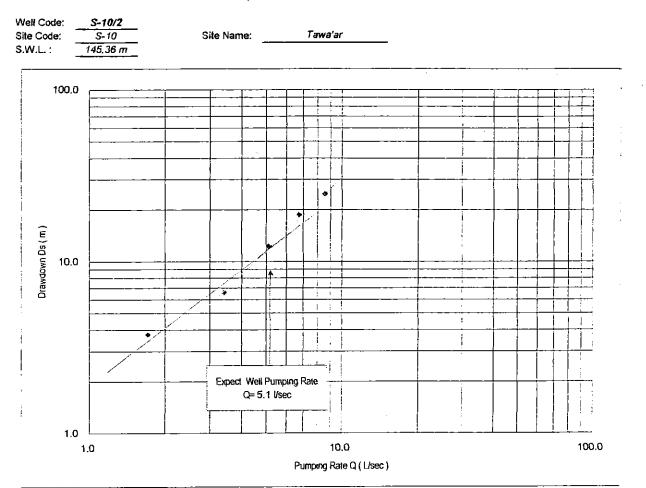
Al Hesn

Site code:

Site name: <u>Tawa'ar</u>

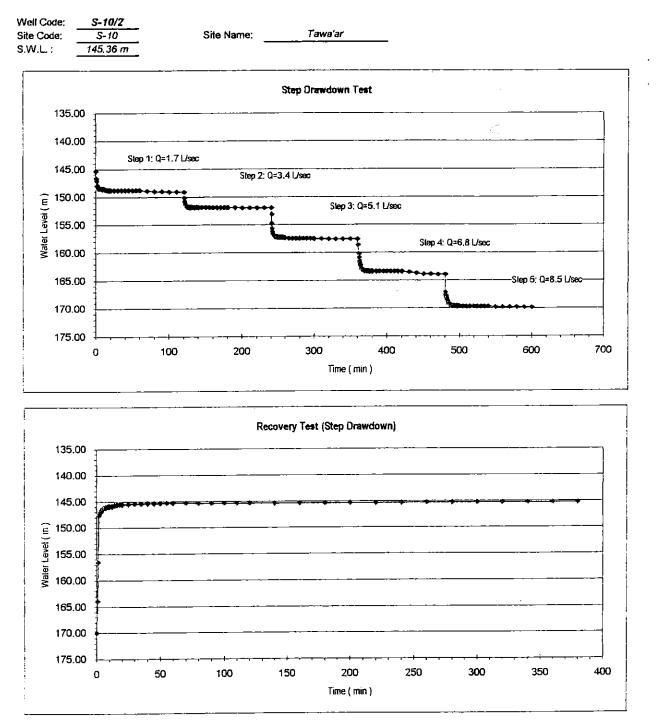
Governorate: Sana'a

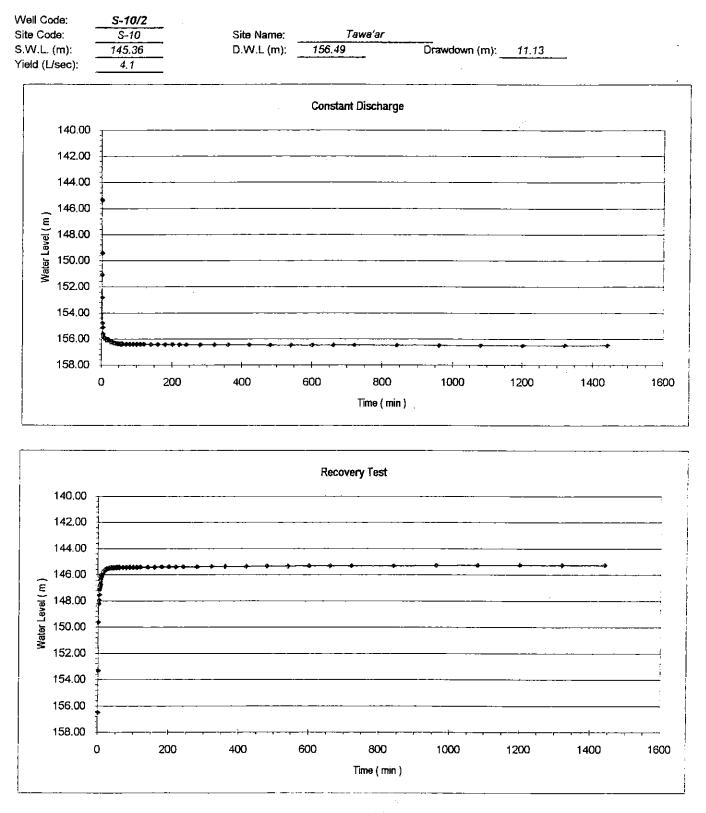
Duration	Cons	tant Dischrge Te	est	Recove	ery Test	Water Analysis	
Duration (min)	Water level (m)	Drawdown (m)	Pumping rate (I/sec)	Water level (m)	Residual (m)	Conductivity ()	Remarks
70.0	156.40	11.04		145.45	0.09		
80.0	156.40	11.04		145.45	0.09		
90.0	156.40	11.04		145.44	0.08		
100.0	156.41	11.05		145.44	0.08		
110.0	156.41	11.05		145.44	0.08		
120.0	156.41	11.05	† †	145.43	0.07	1	
140.0	156.42	11.06		145.42	0.06		
160.0	156.42	11.06		145.42	0.06		
180.0	156.43	11.07		145.41	0.05		
200.0	156.43	11.07		145.41	0.05		
220.0	156.45	11.09		145.41	0.05		<u>.</u>
240.0	156.46	11.10		145.41	0.05		<u>.                                 </u>
280.0	156.46	11.10		145.40	0.04		
320.0	156.46	11.10	1	145.39	0.03		
360.0	156.46	11.10		145.38	0.02		
420.0	156.46	11.10		145.37	0.01		
480.0	156.47	11.11		145.36	0.00		
540.0	156.47	11.11		145.35	-0.01		
600.0	156.48	11.12		145.33	-0.03		
660.0	156.48	11.12		145.33	-0.03		
720.0	156.48	11.12		145.32	-0.04		
840.0	156.48	11.12		145.32	-0.04		
960.0	156.49	11.13		145.31	-0.05		
1080.0	156.49	11.13		145.28	-0.08		
1200.0	156.49	11.13		145.27	-0.09		
1320.0	156.49	11.13		145.27	-0.09		
1440.0	156.49	11.13		145.27	-0.09		
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JULE DIAWOOMI TEST	Step	Drawdown	Test
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Step	Q(I/sec)	D.W.L.(m)	Ds(m)
1	1.7	149.11	3.75
2	3,4	151.97	6.61
3	5.1	157.59	12.23
4	6.7	163.98	18.62
5	8.5	169.90	24.54





### **Constant Dischrge Test**

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# Pumping Test Report Sheet

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Well code:	Site code:S	S-11	Site name	:AI	Hesn-Al Abya	ad .
District:	Jehana		Governo	orate:	Sana'a	
	-				-	
Target water source:	New projected de	ep well	_	Well depth:	350 m	
Contractor:	Abdulkhaleg M.	1.0				
Hydrogeologist in charge:	- <u>-</u>		Gounaid	·		
Operator:	Mohammed	Azeen				
Date of start of the test:	08/08/2006	n	ate of end o	of the test	13/08/20	າດຄ
					lveco aifo	<u>////</u>
Pump type: <u>V</u>			ngine:	0.67 m	•••••••••••••••••••••••••••••••••••••••	<u></u>
Pump installation depth:	<u>248 m</u>		atum ievei.	<u>0.67 m</u>	3.VV.L	G.L152.82 r
Step drawdown test						
	9-8-2006-4:15pm	Date/hou	r finished:	11-8-2006-6	5:00amTota	al hours: <u>37:4</u>
Yield (l/sec): 1 <sup>st</sup> step	1.20 2 <sup>nd</sup> step 2.40	03 <sup>rd</sup> ste	р_ <u>3.60</u>	4 <sup>th</sup> step	305 <sup>th</sup> step	6.00
Water level before start th	 ie test (G.Lm):	154.1	1	-		
Water level after end of 5th	<sup>ih</sup> step (G.Lm):	243.1	2			
Water level after recovery	-	154.1	1	Recovery hou	urs: <u>27:45</u>	
Constant discharge test	=					
Date/hour started:1	11-8-2006-8:00am	Date/hour	r finished:	13-8-2006-1.	2:00am_ Tota	al hours: <u>50:00</u>
Yield (I/sec): <u>3.80</u>	-					
Water level before start of the	e test (G.Lm):	154.11	1			
Water level after end of te	st (G.Lm):	219.12	?			
Water level after recovery	(G.Lm):	154.11	1	Recovery hou	irs: <u>26:00</u>	
Drawdown (m):65.0	)1					

Revised by:

Name.:

Date:

### **Provisional Step Drawdown Test**

Well Code:	S-11/1	Site code:	<u>S-11</u>	Pump on date/hour:	8-8-2006-8:30am
Site name:	Al Hesn-Al Abyad			Pump off date/hour:	8-8-2006-11:00am
District:	Jehana			End of recovery hour:	9-8-2006-4:10am
Governorate:	Sana'a			S.W.L ( m ):	153.49

Contractor: <u>Abdulkhaleg M. AL- Goli</u> Hydrogeologist: <u>Ali Abdullah Nagi AL- Gounaid</u>

Operator: Mohammed Azeen

5	1st S	Step	2nd 3	Step	3rd St	ер	4th S	Step	5th S	Step	Because
Duration (min)	W.L. (m)	Yield ( l/sec)	W.L. (m)	Yield ( !/sec)	W.L. (m)	Yield ( l/sec)	W.L. (m)	Yield ( l/sec)	W.L. (m)	Yield ( l/sec)	Recovery (m)
0.0	153.49	1.20	160.14	2.40	168.19	3.60	178.98	4.80	194.60	6.00	213.58
0.5	155.14		190.92		168.93		179.31		194.21		207.95
1.0	156.60		161.34		168.89		179.87		195.04		204.12
1.5	157.08		161.45		169.28		180.54		195.52		201.99
2.0	157.61		161.81		169.59		181.19	· · · · · · · · · · · · · · · · · · ·	196.01		200.22
2.5	158.12		162.01		169.86		181.72		196.54		198.88
3.0	158.62		162.38		170.01		182.11		197.68		197.83
3.5	158.64		162.82		170.22		182.62		198.45		197.27
4.0	158.70		163.09		170.31		182.81		199.03		196.98
4.5	158.75		163.59		170.44		183.27		199.50		196.66
5.0	158.77		163.72		170.58		183.76		199.98		196.10
6.0	158.79		164.06		171.09	-	184.30		200.66		195.01
7.0	158,81		164.19		171.73		184.85		201,70		193.98
8.0	158.85		164.31		172.42		185.52		202.73		193.11
9.0	158.89		164.47		172.96		186.03		203.21		192.21
10.0	159.08		164.52		173.37		186.59		203.94		191.42
12.0	159.34		165.64		174.15		187.45		205.22		198.88
14.0	159.41		165.48		174.87		188.38		206.43		188.21
16.0	159.48		165.73		175.44		189.26		207.52		186.94
18.0	159.59		165.98		175.87		189.95		208.46		185.69
20.0	159.98		166.33	-	176.49		190.78		209.47		184.45
22.0	160.00		166.68		176.71	ĺ	191.35		210.35		183.57
24.0	160.04		166.71		177.02		192.04		211.18		182.56
26.0	160.07		166.95		177.64		193.02		212.02		181.81
28.0	160.11		167.88		178.53		193.83		212.95	-	180.96
30.0	160.14		168.19		178.98		194.60		213.58		180.33
50.0											178.49
60.0	• •		-			-	<u> </u>				176.08
70.0			-			_					174.89
80.0			<u>.</u>								172.76
90.0					-				<u>.</u>		170.41
100.0							-				168.35
110.0						<u> </u>					166.33
120.0		t			<u> </u>	· ·					164.34
140.0			<del></del> .		<u> </u>						161.73
160.0			· · · ·				·· ·· ··			ſ	159.17
180.0											158.18
200.0					i						157.07
220.0	<u>_</u>		<u> </u>		-						156.90
340.0	1					[					156.06

### Provisional Step Drawdown Test (2/2)

Well Code:	<u>S-11/1</u>	Site code:	<u>S-11</u>	Pump on date/hour:	
Site name:	Al Hesn-Al Abyad			Pump off date/hour:	
District:	Jehana			End of recovery hour:	<u>_</u>
Governorate:	Sana'a			S.W.L ( m ):	
				_	

Contractor: <u>Abdulkhaleg M. AL- Goli</u> Hydrogeologist: <u>Ali Abdullah Nagi AL- Gounaid</u> Operator: <u>Mohammed Azeen</u>

	1st S	Step	2nd 3	Step	3rc	Step	4th	Step	5th	Step	<b>D</b>
Duration (min)	W.L. (m)	Yield ( l/sec)	W.L. (m)	Yield ( l/sec)	W.L. (m)	Yield ( l/sec)	W.L. (m)	Yield ( l/sec)	W.L. (m)	Yield ( I/sec)	Recovery (m)
460.0								·			155.59
760.0											155.30
820.0											155.22
880.0											155.17
940.0			<u></u>								155.08
1000.0				<u> </u>							155.05
1060.0	<u></u>	<u> </u>	·								155.02
1180.0			<u> </u>								154.98
1300.0							· ·				154.89
1360.0			-				;				154.81
1430.0											154.78
					-						
				_							
							<u> </u>				
			_								
							1				
							1				
									<u> </u>		
					<u>-</u>		<u>_</u> ;				
			<u> </u>				<u>_</u>				
							<u> </u>				
					<u></u>		i				
		_									
											<u></u>
						14-289		·			

## Step Drawdown Test (1/2)

Well Code:	<u></u>	Site code:	S-11
Site name:	Al Hesn-Al Abyad		
District:	Jehana		
Governorate:	Sana'a		

Pump on date/hour:	9-8-2006-4:15pm
Pump off date/hour:	10-8-2006-2:15am
End of recovery hour:	11-8-2006-6:00am
S.W.L ( m ):	154.78

Contractor: Abdulkhaleg M. AL- Goli

Hydrogeologist: Ali Abdullah Nagi AL- Gounaid

Operator: Mohammed Azeen

	1st \$	Step	2nd	Step	3rd S	Step	4th S	Step	5th S	Step	
Duration (min)	W.L. (m)	Yield (I/sec)	W.L. (m)	Yield ( l/sec)	W.L. (m)	Yield ( l/sec)	W.L. (m)	Yield (I/sec)	W.L. (m)	Yield ( l/sec)	Recovery (m)
0.0	154.78	1.20	168.71	2.40	180.04	3.60	199.49	4.80	223.78	6.00	243.79
0.5	161.08		169.16		181.69		200.01		224.22		238.02
1.0	161.10		169.51		182.05		201.18		224.54		236.13
1.5	161.14		169.89		182.20		202.25		224.87		230.00
2.0	161.16		170.08		182.26		202.85		225.08		229.82
2.5	161.19		170.21	_	182.30		203.15		225.63		229.41
3.0	161.22		170.31		182.35		203.63		225.95		228.06
3.5	161.26		170.42		182.58		203.97		226.28		227.08
4.0	161.28		170.59		182.76		204.21		226.57		226.65
4.5	161.30		170.68		183.09		204.88		226.80		226.37
5.0	161.34		170.76		183.52		205.33		227.11		226.03
6.0	161.41		171.08		183.64		205.95		227.69		224.95
7.0	161.46		171.21		183.90		206.22		228.14		223.98
8.0	161.54		171.32		184.21	_	206.77		228.52		223.12
9,0	162.01		171.48		184.52		206.11		228.82		222.09
10.0	162.39		171.69		184.77		207.70		229.00		221,20
12.0	162.50		171.90		185.30		208.56		230.01		219.43
14.0	162.78		172.06		185.71		209.37		230.38		217.49
16.0	163.00		172.21		186.00	ſ	210.22		230.82		216.27
18.0	163.54		172.37		186.66		210.74		231.32		214.48
20.0	163.99		172.61		186.78		211.35		231.74		<b>21</b> 3.18
25.0	164.73		172.13	-	187.86		212.69		232.50		209.95
30.0	165.42	l	173.13	-	188.72		213.78		233.41		207.23
35.0	165.97		173.30		189.34		214.73		234.10		204.71
40.0	166.35		173.37		189.96	Î	215.48		235.03		202.71
45.0	166.58		173.44		190.86		216.11		235.92		200.45
50.0	166.73	·	174.08		192.04		216.83		236.54		198.73
55.0	167.35		174.85		193.67		217.31		237.16		197.16
60.0	167.52		175.10		195.05		217.98		237.61		195.68
70.0	168.03		175.26		196.28		219.49		238.64		192.95
80.0	168.24		176.90		196.99		220.94		239.47		191.19
90.0	168.36		177.54		197,95		221.98		240.26		189.47
100.0	168.69		178.88		198.63		222.77		241.38		188.27
110.0	168.70		179.54		199.07		223.29		242.52		187.37
120.0	168.71		180.04		199.49		223.78		243.79		186.10
140.0											185.12
160.0											184.61
180.0											183.60
200.0											182.59
230.0	· · · · · ·										179.14

### Step Drawdown Test (2/2)

S-11

Well	Code:
Distri	ict:

Jehana

S-11/1 Site code:

Site name: <u>Al Hesn-Al Abyad</u>

1st Step 2nd Step 3rd Step 4th Step 5th Step Duration Recovery W.L. Yield W.L, Yield W.L. Yield W.L. Yield W.L. Yield ( min ) (m) (m) (I/sec) (m) (l/sec) (m) (l/sec) (m) (l/sec) (m) ( l/sec) . 290.0 177.30 350.0 176.22 380.0 173.46 440.0 171.50 500.0 168.40 560.0 166.08 680.0 165.03 800.0 164.23 860.0 163.10 920.0 162.40 980.0 161.51 1040.0 160.50 1100.0 159.49 1160.0 158.48 1220.0 157.38 1280.0 156.89 1340.0 156.41 1400.0 156.06 1460.0 155.90 1520.0 155.45 1580.0 155.02 1640.0 154.78

14-291

## Constant Discharge & Recorery Test (1/2)

Well Code:	<u>S-11/1</u>	Site code:	S-11
Site name:	Al Hesn-Al Abyad		
District:	Jehana		
Governorate:	Sana'a		

 Contractor:
 Abdulkhaleg M. AL- Goli

 Hydrogeologist:
 Ali Abdullah Nagi AL- Gounaid

 Operator:
 Mohammed Azeen

 Pump on date/hour:
 11-8-2006-8:00am

 Pump off date/hour:
 12-8-2006-8:00am

 End of recovery hour:
 13-8-2006-12:00am

S.W.L ( m ): _	154.78
D.W.L ( m ):	219.79
Yield (l/sec):	3.8

Duration Co		tant Dischrge T	est	Recove	ry Test	Water Analysis	
Duration (min)	Water level (m)	Drawdown (m)	Pumping rate (l/sec)	Water level (m)	Residual (m)	Conductivity ( )	Remarks
0.0	154.78	0.00		219.79	65.01		
0.5	160.16	5.38		213.97	59.19		
1.0	163.52	8.74		210.09	55.31		
1.5	166.34	11.56		209.99	55.21		
2.0	167.29	12.51		208.13	53.35		
2.5	168.14	13.36		207.06	52.28		
3.0	169.70	14.92		206.76	51.98		
3.5	169.95	15.17		205.75	50.97		
4.0	170.30	15.52		205.75	50.97		
4.5	170.48	15.70		205.74	50.96		
5.0	170.60	15.82		204.98	50.20		
6.0	171.11	16.33		204.13	49.35		
7.0	171.62	16.84		203.88	49.10		
8.0	172.01	17.23		202.93	48.15		
9.0	172.55	17.77		202.76	47.98		
10.0	172.89	18.11		202.42	47.64		
12.0	173.60	18.82		201.02	46.24		
14.0	174.20	19.42		200.56	45.78		
16.0	174.65	19.87		199.93	45.15		
18.0	175.23	20.45		198.28	43.50		
20.0	175.61	20.83		197.12	42.34		
25.0	177.14	22.36		196.93	42.15		
30.0	178.63	23.85		195.87	41.09		
35.0	179.69	24.91		194.21	39.43		
40.0	180.50	25.72		193.41	38.63		·
45.0	181.03	26.25		192.72	37.94		
50.0	181.52	26.74		191.93	37.15		
55.0	182.70	27.92		190.41	35.63		
60.0	183.95	29.17	1	189.82	35.04		

## Constant Discharge & Recorery Test (2/2)

Well Code: District: S-11/1

Jehana

.

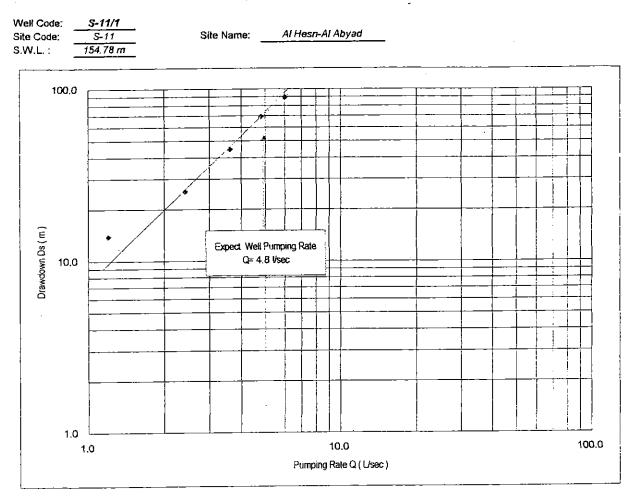
Site code: \_\_\_\_\_\_S-11

Site name: <u>Al Hesn-Al Abyad</u>

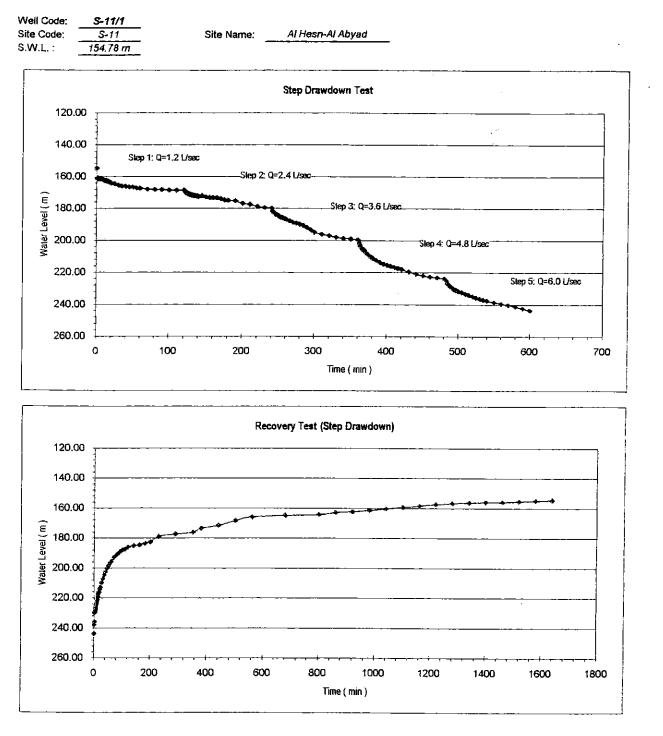
Governorate: Sana'a

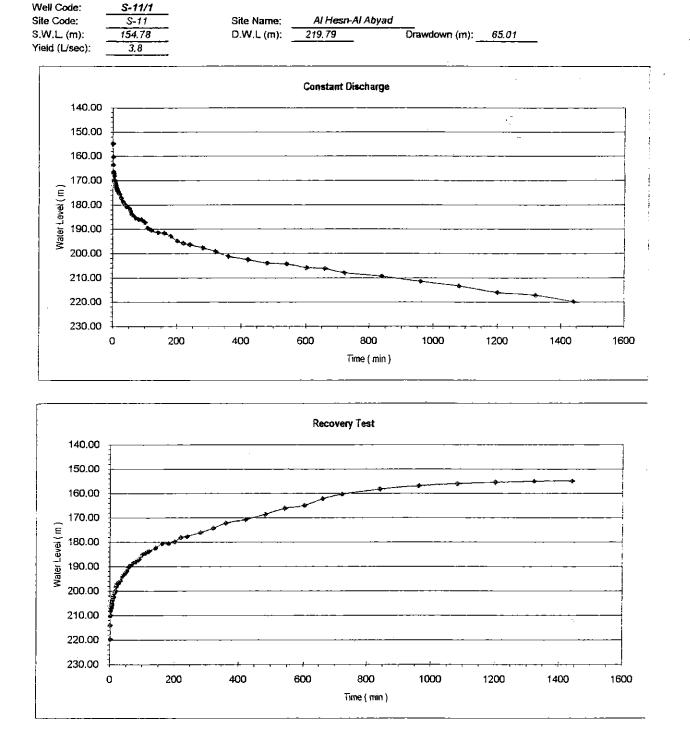
Duratian	Cons	tant Dischrge Te	est	Recove	ery Test	Water Analysis	
Duration( (min)	Water level (m)	Drawdown (m)	Pumping rate (l/sec)	Water level (m)	Residual (m)	Conductivity ()	Remarks
70.0	185.37	30.59		188.68	33.90		
80.0	185.93	31.15		187.84	33.06		
90.0	186.18	31.40		187.03	32.25		
100.0	187.14	32.36		185.18	30.40		
110.0	189.53	34.75		184.45	29.67		
120.0	190.44	35.66		183.68	28.90		
140.0	191.37	36.59		182.48	27.70		
160.0	191.56	36.78		180.64	25.86		<u>.</u>
180.0	193.04	38.26		180.68	25.90		
200.0	194.97	40.19		179.90	25.12		
220.0	195.93	41.15		178.13	23.35		
240.0	196.42	41.64		177.73	22.95		
280.0	197.76	42.98		176.10	21.32		
320.0	199.17	44.39		174.37	19.59		
360.0	201.24	46.46		172.20	17.42		
420.0	202.49	47.71		170.78	16.00		
480.0	203.91	49.13		168.63	13.85		
540.0	204.39	49.61		166.22	11.44		
600.0	205.85	51.07		164.96	10.18		
660.0	206.25	51.47		162.28	7.50		
720.0	207.98	53.20		160.38	5.60		
840.0	209.35	54.57		158.31	3.53		
960.0	211.49	56.71		156.96	2.18		
1080.0	213.33	58.55		156.06	1.28		
1200.0	215.97	61.19		155.58	0.80		
1320.0	217.12	62.34		155.07	0.29		
1440.0	219.79	65.01		154.95	0.17		
1560.0				154.78	0.00		
	-						

1.2 · · · 2.25



Slep	Q(I/sec)	D,W.L.(m)	Ds(m)
1	1.2	168.71	13.93
2	2.4	180.04	25.26
3	3.6	199.49	44.71
4	4.8	223.78	69.00
5	6.0	243.79	89.01





#### **Constant Dischrge Test**

	·····	. <u></u>					
		Pumpir	ia Test	Report	Sheet		
		· · · · · · · · · · · · · · · · · · ·					
Well code:	S-12	_ Site code:	S-12	Site name	:	Mahdah	<u> </u>
District:		Jehana		. Governo	orate:	Sana'a	
<b>-</b> / /		No			Well depth:	350 m	
l arget water	source:	New projected	aeep weii		wen deptri.		
Contractor:		Abdulkhaleg	M. AL- Go	li			
_		Ali Abdu					
Operator:		Mohmme					
			-				
Date of start o	f the test:	12/8/2006		Date of end of	of the test:	15/8/200	06
Pump type:	Ve	ertical pump	<del></del>	Engine:		lveco aifo	
Pump installat	ion depth:	248 m	<u> </u>	Datum level:	0.82 m	S.W.L.: _	G.L57.78 m
Step drawdov							
		-8-2006-10:15am				- <u>9:05am</u> Tota	-
		<u>30</u> 2 <sup>nd</sup> step 2			_4" step <u>_5.</u>	<u>20</u> 5 <sup>th</sup> step _	6.50
		e test (G.Lm):					
		step (G.Lm):		5.71		0.40	
Water level aft	er recovery (	(G.Lm):	63.	01	Recovery ho	ours: <u>3:40</u>	
Constant dia	abarra taat						
Constant dis Date/hour star	<u>*_</u>	<del>=</del> 3-8-2006-8:10pm	Date/h/	our finished:	15-8-2006-	5.10am Tota	il hours: 31:00
Yield (l/sec):		<u>5-0-2000-0. TOpin</u>			0_0_2000	<u>0.100</u> 10.0	
Water level befo		- • test (G tm);	57.	78			
Water level aft		•	76.				
Water level aft		•	57.		Recovery ho	urs: 7:00	
Drawdown (m)	-						
		<u> </u>					
							ч.

Revised by:

Name :

Date:

### **Provisional Step Drawdown Test**

Well Code:	<u>S-12</u>	Site code:	
Site name:	Mahdah	· · · · · · · · · · · · · · · · · · ·	
District:	Jehana		
Governorate:	Sana'a		

 Pump on date/hour:
 12-8-2006-11:30pm

 Pump off date/hour:
 13-8-2006-2:00am

 End of recovery hour:
 13-8-2006-10:10am

 S.W.L (m):
 58.60

Contractor: Abdulkhaleg M. AL- Goli

Hydrogeologist: Ali Abdullah Nagi AL- Gounaid

Operator: Mohmmed Azeen

<b>D</b> ()	1st 9	Step	2nd s	Step	3rd S	Step	4th 3	Step	5th S	Step	
Duration (min)	W.L. (m)	Yield ( l/sec)	W.L. (m)	Yield ( l/sec)	W.L. (m)	Yield ( l/sec)	W.L. (m)	Yield ( l/sec)	W.L. (m)	Yield ( l/sec)	Recovery (m)
											70.14
0.0	58.60	1.30	61.64	2.60	64.39	3.90	71.04	5.20	77.08	6.50	79.41
0.5	60.35		62.32		65.40		71.87		77.23		77.00
1.0	60.79		62.44	<u> </u>	65.56		72.19		77.28		76.07
1.5	61.12		62.50		65.62		72.88		77.31		75.36
2.0 2.5	61.17 61.22		62.55		65.68 65.75		73.14		77.35		74.28
2.5	61.22		62.57 62.67		65.81		73.92		77.37		72.09
3.0	61.26				65.86		73.92		77.41		72.09
4.0	61.30		62.75 62.83		65.92		74.18 74.64		77.41		70.68
4.0	31.32		62.83		66.02		74.84		77.43		69.54
<u>4.5</u> 5.0	61.34		62.87		66.17		74.85		77.50		68.76
6.0	61.35		62.92		66.28		75.93		77.53		67.81
7.0	61.36		63.18		66.37		76.54		77.57		66.17
8.0	61.30	<u> </u>	63.37		66.49	<u> </u>	76.73		77,61	<u></u>	65.64
9.0	61.38		63.56		66.57		76.77		77.66		65.38
<u>9.0</u> 10.0	61.39		63.81		66.66		76.81	-	77.71		65.19
12.0	61.45		64.16		67.01		76.83		77.95	<u> </u>	65.03
14.0	61,48		64.20		67.74		76.88		78.24		64.87
16.0	61.51		64.23		68.19	·	76.91		78.37		64.71
18.0	61.54		64,26		68.81	+	76.94		78.59	<u>+</u>	64.53
20.0	64.57		64.29		69.31		76.95		78.71		64.33
20.0	61.59		64.33		69.71		76.97		78.87		64.12
24.0	61.61		64.36		70.32		76.99		78.99		63.96
24.0	61.62		64.37		70.52	<u> </u>	77.02		79.15		63.82
28.0	61.63		<u></u>		70.37		77.05		79.29		63.68
30.0	61.64		64.39		71.04		77.08		79.41	<del></del>	63.55
50.0	01.04		04.00				11.00		10.41	<u> </u>	62.82
70.0											62.15
90.0			··		-	+					61.59
110.0	- <u></u>					+					61.19
130.0				<u> </u>		<del> </del> -					60.44
150.0											60.11
170.0						<del>-</del> +					59.87
190.0											59.68
210.0						-	· ·			<u> </u> -	59.50
230.0					····		· · · · · · · · ·				59.32
250.0		<u>_</u>							· · · ·	[	59.15
270.0											59.00
290.0						· {·			<u> </u>		58.88
490.0		— - · · · •	i						<u> </u>		58.60

Well Code:	<u>S-12</u>	Site code:	S-12
Site name:	Mahdah		
District:	Jehana		
Governorate:	Sana'a		

Pump on date/hour:	13-8-2006-10:15am
Pump off date/hour:	12/8/2006 3:45am
End of recovery hour:	14-8-2006-9:05am
S.W.L ( m );	58.60

Contractor: Abdulkhaleg M. AL- Goli

Hydrogeologist: Ali Abdullah Nagi AL- Gounaid

Operator: Mohmmed Azeen

Duration	1st \$	Step	2nd S	Step	3rd S	Step	4th	Step	5th \$	Step	2
Duration (min)	 W.L. (m)	Yield (I/sec)	W.L. ( (m)	Yield ( l/sec)	W.L. (m)	Yield ( l/sec)	W.L. (m)	Yield ( l/sec)	W.L. (m)	Yield (l/sec)	Recovery (m)
0.0	58.60	1.30	63.20	2.60	67.85	4.20	76.97		92.47	6.50	107.53
0.5	59.42		63.31		68.40	4.20	76.93	0.20	93.74		107.53
1.0	60.38		63.48		69.38		76.98		94.21	-	99.12
1.5	61.41		63.59		69.80		77.03	- ·	94,79		95.64
2.0	61.45		63.68		70,20		77.05		95.11		93.49
2.5	61.47	- <del>-</del>	63.84		70.32		77.05		95.63		91.52
3.0	61.48		63.79		70.48		77.06		95.73		89.88
3.5	61.49		64.08		71.00		77.06		96.04		89.54
4.0	61.50		64.19		71.32		77.08	·	96.66	·	89.44
4.5	61.60		64.21		71.52		77.08		96.96		89.35
5.0	61.61		64.24		71.73		77.09		97.27		88.39
6.0	61.63		64.27		72.13		77.09		97.79		85.98
7.0	61.64		64.32		72.30		77.10	-	98.44		83.87
8.0	61,66		64.43	· · · · · · · · · · · · · · · · · · ·	72.93		77.11		99.36		81.27
9.0	61.67		64.44		73.32		77.13		99.68		79.25
10.0	61.69		64.47		73.57		77.17		100.32		77.79
12.0	61.70		64.47		73.84		77.19		100.93		77.34
14.0	61.71		64.59		74.16		77.24		101.59		77.13
16.0	61.74		64.59		74.43		77.43		102,17		77.03
18.0	61.80		64.67		74.72	1	77.53		102.62		76.97
20.0	61.96		64.74		74.76		78.28		102.84		76.85
25.0	62.13		64.92		75.12		81.97		103.14		75.47
30.0	62.57		65.04		76.39		84.34		103.43		70.66
35.0	62.86		65.05 <u>;</u>		76.64		85.65		104.03	'	67.64
40.0	62.93		65.11		76.82		87.99		104.59		66.99
45.0	62.95		65.18	1	76.88		89.14		104.68		65.69
50.0	62.95		65.23		76.89		89.63		104.76		65.61
55.0	62.95		65.37	1	76.91		89.74		105.06		65.60
60.0	62.97		65.48		76.92		89.85		105.16		65.59
70.0	62.99		65.78		76.93		90.03		105.40	†	65.57
80.0	63.01		66.34		76.93		91.05		105.64		65.50
90.0	63.01		67.57		76.94		91.06		105.98		65.44
100.0	63.13		67.57		76.95		91.74		106.14		65.32
110.0	63.18		67.58		76.96		92.13		106.87		65.30
120.0	63.20		67.85		76.97		92.47		107.53		65.27
140.0			· · · · · · · · · · · · · · · · · · ·								64.93
160.0											64.64
180.0	· ·						Ì			. 1	64.37
200.0							i				64.10
220.0											63.83

### Constant Discharge & Recorery Test (1/2)

Well Code:	S-12	Site code:	<u>S-12</u>
Site name:	Mahdah		
District:	Jehana		
Governorate:	Sana'a		

Contractor: <u>Abdulkhaleg M. AL- Goli</u> Hydrogeologist: <u>Ali Abdullah Nagi AL- Gounaid</u> Operator: Mohmmed Azeen 
 Pump on date/hour:
 13-8-2006-8:10pm

 Pump off date/hour:
 14-8-2006-8:10pm

 End of recovery hour:
 15-8-2006-5:10am

S.W.L ( m ):	58.60
D.W.L ( m ): _	77.34
Yield (l/sec):	2.2

Duration	Cons	tant Dischrge T	est	Recove	ery Test	Water Analysis	
Duration (min)	Water level (m)	Drawdown (m)	Pumping rate (I/sec)	Water level (m)	Residual (m)	Conductivity ( )	Remarks
0.0	58.60	0.00		77.34	18.74		
0.5	62.72	4.12	· .	72.73	14.13		
1.0	63.33	4.73		71.81	13.21		<u> </u>
1.5	63.82	5.22		71.52	12.92		
2.0	64.01	5.41		71.02	12.42		
2.5	64.22	5.62		70.98	12.38		
3.0	64.43	5.83		70.79	12.19		
3.5	64.54	5.94	1-	70.66	12.06		
4.0	64.65	6.05		70.52	11.92		
4.5	64.78	6.18		70.40	11.80		•.
5.0	64.93	6.33		70.21	11.61		
6.0	65.06	6.46		70.01	11.41		
7.0	65.13	6.53		69.23	10.63		
8.0	65.23	6.63		68.33	9.73		
9.0	65.27	6.67		68.00	9.40		
10.0	65.32	6.72		67.88	9.28		
12.0	65.43	6.83		67.45	8.85		
14.0	65.80	7.20		67.08	8.48		_
16.0	65.87	7.27		66.99	8.39		
18.0	65.99	7.39		66.56	7.96		
20.0	66,17	7.57		66.17	7.57	2	
25.0	66.97	8.37		65.92	7.32		
30.0	67.50	8.90		65.66	7.06		
35.0	67.62	9.02		65.39	6.79		
40.0	67.82	9.22		65.13	6.53		
45.0	68.32	9.72		64.97	6.37		
50.0	68.58	9.98		64.68	6.08		
55.0	68.67	10.07		64.41	5.81		
60.0	68.72	10.12		64.13	5.53		

## Constant Discharge & Recorery Test (2/2)

Well Code: District: S-12

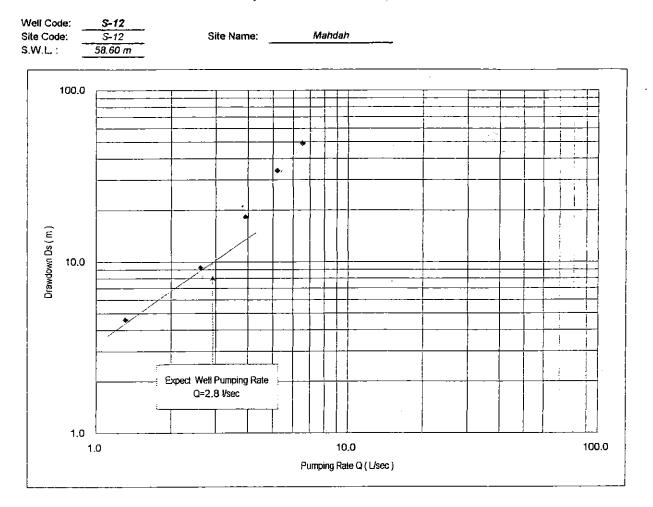
Jehana

Site code:

S-12 Site name: <u>Mahdah</u>

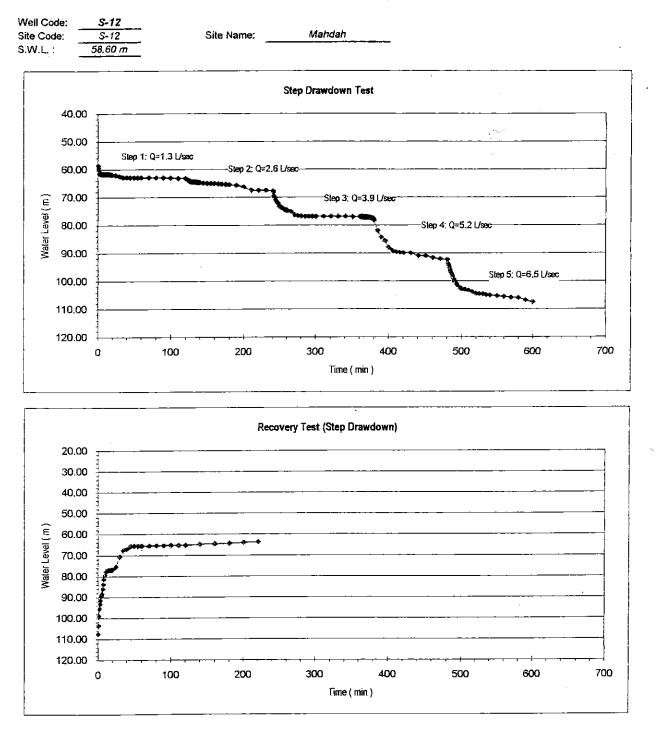
Governorate: Sana'a

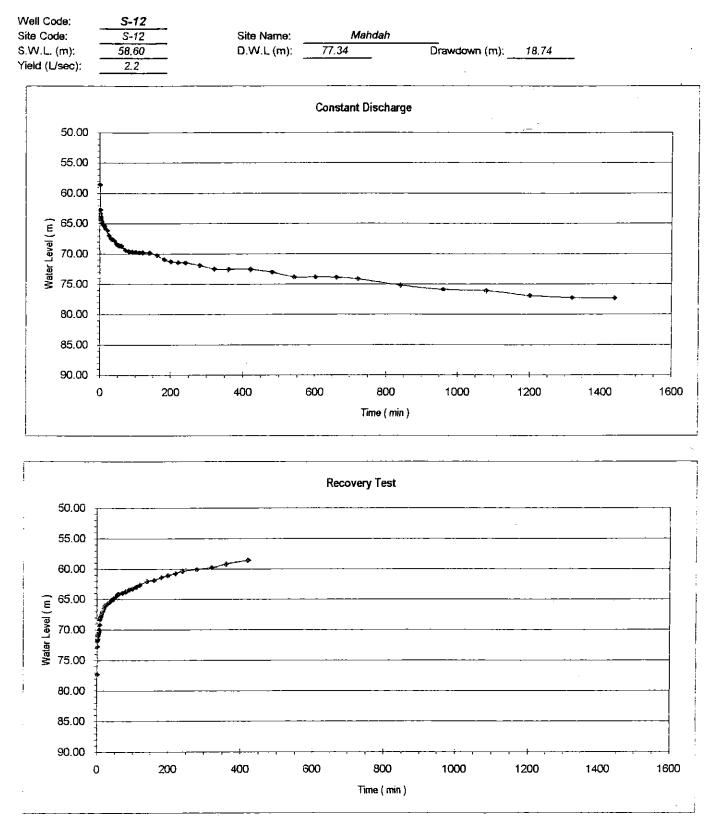
	Cons	tant Dischrge Te	est	Recove	ery Test	Water Analysis	
Duration (min)	Water level (m)	Drawdown (m)	Pumping rate (l/sec)	Water level (m)	Residual (m)	Conductivity ()	Remarks
70.0	69.40	10.80		63.98	5.38		
80.0	69.64	11.04		63.71	5.11		
90.0	69.69	11.09		63.43	4.83		
100.0	69.76	11.16		63.19	4.59		
110.0	69.79	11.19		62.95	4.35		
120.0	69.79	11.19		62.65	4.05		
140.0	69.87	11.27		62.02	3.42		
160.0	70.30	11.70		61.88	3.28		
180.0	70.99	12.39		61.38	2.78		
200.0	71.32	12.72		61.06	2.46		
220.0	71.47	12.87		60.79	2.19		
240.0	71,53	12.93		60.37	1.77		
280.0	71.95	13.35		60.12	1.52		
320.0	72.53	13.93		59.81	1.21		54 1
360.0	72.56	13.96		59.21	0.61		
420.0	72.58	13.98		58.60	0.00		
480.0	73.03	14.43					
540.0	73.84	15.24					
600.0	73,86	15.26					
660.0	73.88	15.28			·		
720.0	74.16	15.56				,	
840.0	75.23	16.63					
960.0	75.90	17.30					
1080.0	76.10	17.50					
1200.0	76.89	18.29					
1320.0	77.27	18.67					
1440.0	77.34	18.74					
	· · · · · · · · · · · · · · · · · · ·						
						<b>↓</b>	<u>-</u> <u>-</u>
						<u> </u>	



Step	Step Q(I/sec)		Ds(m)
1	1,3	63.20	4.60
2	2.6	67.85	9.25
3	3.9	76.87	18.27
4	5.2	92.47	33.87
5	5 6.5		48.93

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### **Constant Dischrge Test**

# Pumping Test Report Sheet

Well code:	S-14	Site code:	S-14	Site name	•	Al Ghail	
District:		 Nehm		Governo	orate:	Sana'a	
Target water	source:	Existing projecte	d deep wel	I	Well depth:	<u>185 m</u>	
Contractor:		Abdulkhaleg	<u> M. AL- Go</u>	li			
Hydrogeologi	st in charge:	Ali Abdu	illah Nagi A	L- Gounaid			
Operator:		Βι	ılul				
Date of start of	of the test:	6/8/2006		Date of end of	of the test:	6/8/200	6
Pump type:	V	ertical pump		Engine:		lveco aifo	
Pump installa	ition depth:	<u>131 m</u>		Datum level:	<u>0.62 m</u>	S.W.L.: _	G.L73.28 n
Step drawdo	own test						
Date/hour sta	irted:		Date/ho	our finished:		Tota	I hours:
Yield (l/sec):	1 <sup>st</sup> step	0. <u>60</u> 2 <sup>nd</sup> step	1.20 _ 3 <sup>rd</sup> s	tep <u>1.80</u>	4 <sup>th</sup> step	105 <sup>th</sup> step	3.00
		e test (G.Lm):					
Water level a	fter end of 5 <sup>1</sup>	<sup>h</sup> step (G.Lm):		. <u>.</u>			
Water level a	fter recovery	(G.Lm):			Recovery hou	ırs:	
Constant di	scharge test						
Date/hour sta	irted:		Date/ho	our finished:		Tota	hours:
Yield (l/sec):							
Water level be	fore start of th	e test (G.Lm):					
Water level a	fter end of te	st (G.Lm):		<u> </u>			
Water level a	fter recovery	(G.Lm):		<u> </u>	Recovery hou	ırs:	
Drawdown (m	ı):						
							<b>`</b>
Revised by:							
Name :	<u></u>	• • • • • • • • • • • • • • • • •	_				
Date:				<b>~</b> .			
			14-9	05	<u> </u>		

## **Provisional Step Drawdown Test**

<u> </u>	Site code:	S-14	Pump on date/hour:	6-8-2006-7:00am
Al Ghail			Pump off date/hour:	6-8-2006-8:00am
Nehm			End of recovery hour:	
Sana'a			S.W.L ( m ):	73.90
	Al Ghail Nehm	Al Ghail	Al Ghail	Al Ghail     Pump off date/hour:       Nehm     End of recovery hour:

Contractor: Abdulkhaleg M. AL- Goli

Hydrogeologist: Ali Abdullah Nagi AL- Gounaid

Operator: Bulul

	1st S	Step	2nd	Step	3rd	Step	4th	Step	5th	Step	
Duration (min)	W.L. (m)	Yield ( l/sec)	W.L. (m)	Yield (I/sec)	W.L. (m)	Yield ( l/sec)	W.L. (m)	Yield (l/sec)	W.L. (m)	Yield ( l/sec)	Recovery (m)
0.0	73.90	0.60	83.64	1.20		1.80		2.40		3.00	
0.5	79.30		83.96				·				
1.0	79.92		84.21								
1.5	80.20		84.40								
2.0	80.42		84.60				•		- •		
2.5	80.70		85.00								
3.0	80.85		85.48								
3.5	80.98		85.86								
4.0	81.02		86.20								
4.5	81.14		86.64								
5.0	81.25		87.00								۰.
6.0	81.33		87.74								
7.0	81.52		88.20								
8.0	81.65		88.82								
9.0	81.75		89.47								-
10.0	81.80		90.02						-		
12.0	81.80		90.73								
14.0	81.84		91.51								
16.0	81.82		91.95								
18.0	82.06		92.00								
20.0	82.35		92.26								
22.0	82.35		92.56					_			
24.0	82.79		93.40								
26.0	83.15		93.86		-						
28.0	83.50		94.15								
30.0	83.64		94.36						_		
				· .							
							- <u>-</u>				
		Pumped water is very dirty (lot of cla Pump blocked. Can not continue Well collapsed? Well depth measu				nd)	-				
						n [					
				•							
											<u> </u>
					1	4-306			:		