

1 STATE OF NEW MEXICO
2 ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
3 OIL CONSERVATION COMMISSION
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6 APPLICATION OF TARGA MIDSTREAM SERVICES
7 LIMITED PARTNERSHIP AS OPERATOR FOR VERSADO
8 GAS PROCESSORS, LLC ("TARGA") FOR APPROVAL TO
9 INJECT ACID GAS INTO TARGA'S EXISTING EUNICE GAS
10 PLANT SALT WATER DISPOSAL (SWD) WELL NO. 1
11 (API NO. 30-025-21497), LEA COUNTY, NEW MEXICO.
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15 CASE NO. 14575
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22 TESTIMONY OF WILLIAM JONES
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25 My name is William V. Jones.

26 I am a registered professional petroleum engineer. I graduated from New Mexico
27 State University in 1979 with bachelor of science degrees in civil engineering and
28 geological engineering.

29 I have been employed with the Engineering Bureau of the Oil Conservation
30 Division as a petroleum engineer since March 2002. I serve as a hearing examiner. My
31 other duties include reviewing applications for salt water disposal permits, and preparing
32 the reports to the Environmental Protection Agency regarding Class II wells in New
33 Mexico's Underground Injection Control Program. Class II wells include acid gas
34 injection wells, salt water disposal wells, and other injection wells.

35 Before coming to work at the Oil Conservation Division, I spent over 21 years
36 working in the oil and gas industry in various engineering capacities beginning in 1979.
37 Approximately half of my work within the oil and gas industry was in New Mexico.

38 In Case 14575 Targa Midstream Services Limited Partnership as operator for
39 Versado Gas Processors, LLC (“Targa”), seeks authority to inject oil field produced
40 water, natural gas processing plant waste water and compressed acid gas (hydrogen
41 sulfide and carbon dioxide) as commingled or separate streams into the San Andres
42 formation, at an **open hole depth interval from 4250 feet to 4950 feet** below the
43 surface, through its Eunice Gas Plant SWD Well No. 1 (API No. 30-025-21497) which is
44 located 2580 feet from the South line and 1200 feet from the West line, Unit Letter L of
45 Section 27, Township 22 South, Range 37 East, NMPM, Lea County, New Mexico.

46 I have reviewed Targa’s pending application, the permitting history for the well
47 and for this acid gas injection well project, the well file for the Eunice Gas Plant SWD
48 Well No. 1 and well files and logs for wells within the area of review.

49 My testimony in Case 14575 will address:

- 50 (1) My review of the available information concerning the Eunice Gas Plant
- 51 SWD Well No. 1 and the permitting history for this project;
- 52 (2) My review of the available data relevant to the area of review;
- 53 (3) My concerns regarding the application; and
- 54 (4) My recommendations to the Oil Conservation Commission.

55 **1. Review of the Eunice Gas Plant SWD Well No. 1 and the Relevant**
56 **Permitting History.**

57 I prepared a chronology for the subject well, based on my review of the applicable
58 permits and the well file. The chronology is **OCD Exhibit B.**

60 The Eunice Gas Plant SWD Well No. 1 (API No. 30-025-21497) was drilled for
61 the purpose of disposal and permitted by Division Order SWD-29 on September 21,
62 1961, for salt water disposal into the upper San Andres formation through an **open hole**
63 **from 3935 to 4000 feet**. The well was actually completed in 1961 as a disposal well into
64 an open hole from 4010 to 4550 feet. I found no logs for the disposal interval.

65 In 1974 and 1975 in Order No. R-4936, issued in Case No. 5377 and Order No.
66 R-5003, issued in Case No. 5403, the Commission considered whether injection into the
67 Queen and/or San Andres formations should be allowed to continue in wells located in
68 Sections 13 through 36, Township 22 South, Range 37 East, and in Sections 1 through
69 12, Township 23 South, Range 37 East, because it appeared the injected water was not
70 being contained in the formation in which it was placed. One of the wells the
71 Commission considered was the Eunice Gas Plant Well No. 1. Ordering paragraph 11 on
72 page 13 of R-5003 specifically allowed continued injection into the well, "until further
73 order of the Commission, provided, however, that waters disposed of into said well shall
74 be limited to normal gasoline plant water effluent, and said disposal shall not exceed an
75 average of 1500 barrels of water per day during any one-month period." R-5003 required
76 remedial cement work on numerous area wells in an attempt to stop the water flows and
77 more frequent, witnessed Bradenhead testing. R-5003 further provided that the case
78 would be re-opened for reconsideration in November 1975. I have not been able to locate
79 any further order issued in these cases.

80 In 1983, a pump-in injection test reached a rate of 10 barrels per minute into the
81 open hole interval of 4010 to 4550 at a bottom-hole pressure of 3000 psi without showing
82 any apparent evidence of fracturing.

83 On May 30, 2000, the SWD-29 permit was amended to allow a packer setting of
84 3814 feet and disposal of produced water, cooling tower water, and boiler blowdown
85 water into the existing **open hole from 4010 to 4550 feet**.

86 Targa appeared before the Division in Case No. 13865 in 2007 requesting to
87 utilize a proposed new well, to be placed approximately 330 feet from the existing Eunice
88 Gas Plant SWD Well No. 1, for disposal of natural gas processing wastes from Targa's
89 Eunice Gas Plant and South Eunice Compressor Station into the San Andres formation
90 through **perforations from 4500 to 5000 feet**. The Division issued hearing Order R-
91 12809 granting this relief in September 14, 2009. Order R-12809 required the existing
92 Eunice Gas Plant SWD Well No. 1 to be properly plugged and abandoned. Order R-
93 12809 also provided that the injection authority granted by the order would terminate in
94 one year if the operator had not commenced injection operations pursuant to the order,
95 unless the Division granted an extension.

96 In August of 2008, Targa petitioned the Division to extend the deadline to
97 commence disposal and cited the following reasons: (i) additional time is needed to plug
98 nearby wells required in the order and (ii) the location of this acid gas injection well may
99 be moved if approved by the Division in an upcoming hearing. Case No. 13865 was re-
100 opened, and Division Order R-12809-B was issued on August 8, 2008. The order granted
101 Targa's request and extended the deadline to commence disposal to September 14, 2009.

102 In February 2009, without mailing out new individual certified notices, Targa
103 administratively requested that the permissions granted in Division Order R-12809 be
104 transferred from its proposed new well to the nearby existing Eunice Gas Plant SWD
105 Well No. 1. Targa proposed equipping the old well, drilled in 1961, with a new cemented

106 liner extending from surface to 4450 feet, and proposed produced water and Acid Gas
107 disposal into an **open hole from 4450 to 4950** in the San Andres formation. The
108 Division issued administrative Order SWD-1161 on February 23, 2009, granting Targa's
109 request. Order SWD-1161 set a new maximum surface disposal pressure limit of 900 psi,
110 required installation of a one-way subsurface safety valve in the tubing, and retained
111 jurisdiction for entry of further orders. Order SWD-1161 also provided that the injection
112 authority granted by the order would terminate in one year if the operator had not
113 commenced injection operations, unless the Division granted an exception.

114 On August 12, 2010, after receiving no further request to extend the deadline to
115 commence disposal, Mr. Daniel Sanchez as enforcement manager of the Division,
116 informed Targa in writing that SWD-1161 and R-12809, as amended, had expired.

117 On November 9, 2010, Targa filed its current application for approval to inject
118 into the Eunice Gas Plant Salt Water Disposal (SWD) Well No. 1.

119 Throughout the life of the well, the monthly reported disposal rate and disposal
120 pressures have been haphazard at best and most likely grossly inaccurate. The Division's
121 records as to disposed volumes are therefore unreliable. **OCD Exhibit C** is a summary
122 of the reported disposal rate and disposal pressures for the well for the period January
123 2006 to October 1, 2010, taken from the Division's RBDMS (Risk Based Data
124 Management System). **OCD Exhibit D** is a Rate vs. Time plot I prepared using reported
125 disposal rate data from 1994 to date, taken from <http://octane.nmt.edu/gotech/Main.aspx>
126 (New Mexico Tech's web site).

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2. Area of Review Data Relevant to Targa's Application.

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There are a large number of wells in the Area of Review for the Eunice Gas Plant SWD Well No. 1: within ½ mile there are 3 wells that penetrate the San Andres or at least some part of the San Andres; within 1 mile there are 25 such wells; and within 2 miles there are over 230 such wells. In contrast, the 7 permitted acid gas injection wells in New Mexico have **no wells or only one well** within one mile penetrating the disposal interval. Targa's proposed Monument AGI Well No. 1 does have 11 wells within 1 mile, but its disposal interval is the Devonian formation. **OCD Exhibit E** is a list I prepared showing the number of wells within the Area of Review for the 7 existing and two proposed acid gas injection wells in New Mexico.

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I found three wells within one half mile of the subject well that penetrate the San Andres. **OCD Exhibit F** is a chart I prepared summarizing the information I found regarding the wells. Two of the wells, the Santa Rita #002 and the Santa Rita #012, are located almost ½ mile from the subject well. They both appear to be cemented through the San Andres. The third well is the Langlie Mattix Penrose Sand Unit Well No. 252 (the LMPSU), which is located only 1650 feet from the subject well. The LMPSU was drilled into the top of the San Andres and plugged back with steel wool. Targa has agreed to re-open and drill out this well to the old total depth and plug it back to 3700 feet using more competent plugs.

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I found 22 wells between ½ mile and one mile from the subject well that penetrate the San Andres. **OCD Exhibit G** is a chart I prepared summarizing the information I found regarding these wells. There are at least 7 wells that penetrate the San Andres

151 formation beyond ½ mile but within 1 mile of this proposed Acid Gas disposal well that
152 still have portions of casing over the San Andres formation unprotected with cement:

153 a. Two Salt Water Disposal wells extending from the San Andres to deeper
154 depths:

155 Christmas #3 30-025-10500 Perfed 4164 to 5314 feet. SWD-606.

156 A.L. Christmas #1 30-025-25412 Perfed 4026 to 5314 feet. SWD-957.

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158 b. Two Plugged and Abandoned wells with issues in the lower San Andres:

159 J V Baker #11 30-025-10486 Open 5028 to 5500 feet.

160 Baker A #5 30-025-10467 Open 4950 to 5500 feet.

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162 c. Three wells active in deeper formations – one exposed to the upper San
163 Andres and the other two are exposed across the entire San Andres and even
164 beyond:

165 J V Baker #9 30-025-10415 Open 3400 to 4300 feet.

166 Will Cary #8 30-025-10413 Open 3800 to 6175 feet.

167 Christmas 28 #4 30-025-39049 Open 3606 to 4823 feet.

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169 **OCD Exhibit H** is a chart showing the location of these 7 wells. **OCD Exhibit I** is a
170 wellbore diagram of one of these wells, the Will Cary #8, showing the large open interval
171 that will be exposed to corrosion. If the disposal plume enters the corroded casing, H2S
172 will be produced with the gas stream or released when pulling unit crews work on the
173 well.

174 There are other wells within 1 mile that penetrate the San Andres formation that
175 have only lite-weight cement across the San Andres formation.

176 Wells within the 1 mile Area of Review that penetrated (drilled through) the San
177 Andres were spud from earliest date, 1937.

178 Other than the subject well, there are 2 active San Andres disposal wells within 1
179 mile and 5 active San Andres disposal wells within 2 miles. Reported disposal rates for
180 these 5 wells range from 135 to 1900 barrels per day.

181 There are no active San Andres production wells within 1 mile, but there are 39
182 San Andres producing wells within 2 miles, most located to the northwest.

183 This is an active area for oil field operations. **OCD Exhibit J** shows most of the
184 active wells within the general area. The best oil producer within 2 miles is within 1 mile
185 of the subject well and is completed in the Abo formation. New wells are being planned,
186 possibly to exploit the Abo formation or other depths below the San Andres formation.

187 There are 25 wells shallower than the top of the San Andres located within 1/2
188 mile and 94 such wells within 1 mile. These shallower wells include many targeting the
189 Penrose Sands where waterflood projects are active - Order R-3247 allowed the Langlie
190 Mattix Penrose Sand Unit Waterflood Project. This South Eunice area is rife with
191 reported waterflows – mostly within the Salado formation, located above the San Andres
192 formation. This area is the “waterflow” area in Order R-5003, requiring remedial
193 cementing and more frequent, witnessed bradenhead surveys.

194 According to the testimony of Hobbs District Supervisor Chris Williams at the
195 2007 permitting hearing for this acid gas injection project, and according to the available
196 records I have reviewed, there are possible Ogallala and Santa Rosa fresh water intervals
197 extending from depths of 50 feet below the surface down to the top of the Rustler
198 anhydrite.

199 The Eunice Gas Plant SWD #1 was squeezed in 1991 after casing leaks were
200 discovered. In my opinion, the leaks most likely allowed some direct injection into any
201 existing Santa Rosa reservoirs or other exposure of those reservoirs to backside
202 communication. The result of the squeeze as shown by the subsequent cement bond log
203 likely protected all fresh water from further contamination behind pipe. Targa’s planned

204 installation of the internal liner, and equipping the well's annulus with diesel, will likely
205 prevent corrosion and extend the life of this well.

206 From the available data, there appears to be a thief zone that has hampered
207 primary cementing jobs within or just below the San Andres formation. In many cases,
208 subsequent squeeze jobs were done pursuant to Order R-5003 to raise cement and cover
209 upper wellbores. For example:

210 a. The Santa Rita Well No. 12 (API: 30-025-36482) was drilled in 2003 to a
211 total depth of 7200 feet and the cement placement was verified with a
212 Cement Bond Log. The cement annular fill-up efficiency was an effective
213 63 percent instead of a more normal 80 percent.

214 b. Other wells such as the J V Baker Well No. 11 indicate also the difficulty
215 in cementing over the San Andres or over formations just below the San
216 Andres.

217 Many of these wells targeting other deeper formations were only cemented across
218 these deeper targets. Most were subsequently squeezed after shallower (bradenhead)
219 water flows were encountered.

220 The *in situ* waters within the San Andres are recognized as corrosive. Many well
221 problems caused by corrosion have occurred throughout the Permian Basin from
222 uncemented San Andres intervals.

223 Despite the large number of wells in the area surrounding the Eunice Gas Plant
224 SWD Well #1, I had difficulty finding recent, offset open-hole logs. Open hole logs are
225 preferable to cased hole logs for determining porosity because there is no need to
226 compensate for the casing. The Laura J. May #1, 30-025-26480, drilled in 1980 and

227 located less than a mile from the subject well, is one of the closest wells with an open-
228 hole log. The log is **OCD Exhibit K**. The San Andres is a dolomite, and from the Laura
229 J. May #1 log, the San Andres appears to be relatively uniform with porosity hovering
230 near 7%. It is not possible to tell only from the available log if the San Andres has
231 adequate porosity development for matrix-like disposal, and it is difficult to estimate at
232 which interval the San Andres will preferably take disposed fluids.

233 **3. Concerns.**

234 A. The Langlie Mattix Penrose Sand Unit Well No. 252 (30-025-10499),
235 operated by Legacy Reserves Operating, LP and located 1850 feet to the northwest,
236 should be repaired so that it does not act as a conduit. This well was drilled in 1957 into
237 the top of the San Andres formation (where it encountered water) and plugged 400 feet
238 back using a reported mixture of lead wool and cement. I agree with Targa's proposal to
239 re-open and drill out this well to the old total depth and then plug the well back to 3700
240 feet, using more competent plugs, under the direction of the Hobbs District Office.

241 B. A large number of potential problems exist just outside the ½ mile radius.

242 For example:

- 243 1. There are a large number of wells beyond the ½ mile radius but within a 2 mile
244 radius, that penetrate the San Andres or some part of the San Andres.
- 245 2. A thief zone appears to have hampered the cementing within or just below the San
246 Andres.
- 247 3. There are 7 wells located beyond the ½ mile radius but within a 2 mile radius that
248 penetrate the San Andres that have portions of their casing within the San Andres
249 that are unprotected with cement. Due to the old wells and poor records, there
250 could be more than 7.
- 251 4. There are additional wells within a 1-mile radius that penetrate the San Andres
252 formation that have only lite-weight (lead) cement across the San Andres
253 formation. The San Andres was not a target producing formation, and cement
254 designs were adjusted accordingly.
- 255 5. If the un-cemented wellbores are exposed to acid gas, that will accelerate
256 corrosion and accelerate pipe failure. In addition, the *in situ* waters are corrosive,

257 and displacement of those waters may speed up corrosion and highlight problems
258 in old uncemented wellbores.

259 6. The area is an active drilling area, and it is likely wells will be drilled to the Abo
260 or other depths below the San Andres formation, possibly penetrating the disposal
261 plume.
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263 C. Because of the large number of potential problems that exist just outside
264 the ½ mile radius, it is important to ensure that any portion of this plume does not extend
265 past the ½ mile radius. Targa predicts that the plume will extend only ¼ mile in 30 years
266 of injection. However, that prediction is based on assumptions, such as uniform (plug
267 like) disposal into 700 feet of open hole and 10 percent porosity. **OCD Exhibit L** shows
268 how much that prediction can change if even one of the variables is changed. In this
269 example, I kept the disposal rate and porosity constant, and assumed a uniform radial
270 invasion. But I changed the size of the disposal interval. That changed the prediction
271 significantly.

272 D. Without logs on the subject well, we can't at this time assume the porosity
273 of the interval in this well taking fluid is an "effective" 10 percent.

274 E. The assumption of plug-like displacement over 700 feet of interval is
275 another stretch which defies nature. For example, a 1983 pump-in injection test on this
276 well showed that this well can accept fluids at a rate of 10 barrels per minute at a bottom-
277 hole pressure of 3000 psi, despite offset logs indicating relatively low porosity. This is
278 consistent with the cementing records indicating thief zones. I am concerned that there
279 may be a fracture or fractures, and that the injected fluid will preferentially follow those
280 fractures to the offsetting un-cemented wellbores. In fact, permeability in reservoirs is
281 best characterized by a log-normal distribution. This is especially true in lower

282 porosities. There will be some intervals in this open hole that will preferentially take the
283 injected Acid Gas and will therefore travel much further in a shorter amount of time.

284 F. The Oil Conservation Commission should require Targa to provide
285 additional data that can be used to better calculate the radius of the plume and establish a
286 time limit for the permit.

287 G. Because of the existing uncemented intervals in Area of Review wells, I
288 am concerned about Targa's proposal to inject between 4450 feet and 4950 feet.
289 Depending on the existing casing in the Eunice Gas Plant SWD #1 well, I recommend
290 that the well be completed to allow disposal between 4850 feet and 4400 feet, to give
291 approximately a 100 foot vertical factor of safety to existing uncemented intervals in
292 Area of Review wells.

293 H. Targa proposes to inject a maximum of 4075 barrels per day; Order R-
294 5003 limits injection in the well to 1500 barrels per day. The Commission will need to
295 determine whether the concerns raised in R-5003 have been addressed, and determine
296 whether its order in this case can supersede R-5003.

297 **4. Recommendations.**

298 I recommend granting Targa's application, providing that Targa complete the
299 remedial work set out below, and providing that Targa constructs and operates the well
300 according to the requirements set out below.

301 Because of the concerns set out above, I recommend that the Oil Conservation
302 Commission limit the permit to the time it takes for the calculated, uniform radius plume
303 to reach a maximum of ½ mile from the well. At that time, Targa should be required to
304 shut this well in, and no further disposal should be allowed. As discussed above, I do not

305 believe the radius can be calculated adequately using the available information. For that
306 reason, I recommend that Targa be required to gather information that can be used to
307 calculate the radius of the plume, and require Targa to re-open this case for hearing
308 within one year to present that information to the Commission. At that time, the parties
309 should re-calculate the time the acid gas plume is predicted to reach ½ mile from the
310 well. The Commission would then be able to amend its order to impose a maximum term
311 for the disposal permit. If Targa wishes to request an increase in the pressure limit based
312 on the results of the Step Rate Test, it would be able to request that increase at the
313 hearing, and account for that pressure limit increase in its calculation of the plume.

314 A. Construction and testing requirements. Prior to injecting acid gas, Targa
315 should be required to construct the well as follows, and complete the following tests:

- 316 1. Depth. Targa should be limited in the permitted depth to dispose of Acid Gas to
317 above 4850 feet and below 4400 feet, giving a 100 foot vertical factor of safety to
318 existing uncemented intervals in Area of Review wells.
- 319 2. Logging. As no logs are available, Targa should be required to run open hole
320 electric logs on this disposal interval, including porosity and resistivity logs.
- 321 3. Injection tubing. Targa should equip the injection tubing so as to keep the acid
322 gases under pressure and in a less corrosive phase. The injection tubing should be
323 coated or constructed to prevent or retard corrosion from a mixture of hydrogen
324 sulfide, wastewater, and carbon dioxide.
- 325 4. Safety valve. Targa should install a one-way safety valve in the tubing below the
326 level of the well head, to prevent backflow of disposed fluids.
- 327 5. Pressure gauges. Targa should be required to keep the tubing/casing annulus
328 loaded with diesel, and pressure gauges on the tubing and tubing/casing annulus.
329 The readings from these meters and gauges should be remotely transmitted to
330 Targa's plant site and this data should be recorded and stored for review by the
331 Division inspectors. This is necessary to prevent and detect dangerous leaks. It
332 will also help to determine the extent of the plume and the effects on this
333 reservoir.
- 334 6. Meters. Targa should be required to install meters on the disposed water and on
335 the disposed acid gas, and keep records of the volumes of water and acid gas
336 injected.
- 337 7. Step Rate Test. Targa should be required to run a Step Rate Test using disposal
338 water after the proposed open hole is completed for disposal and before Acid Gas
339 disposal is commenced. The procedure for this test should be approved by the

340 Division prior to the test and Division personnel should be given an opportunity
341 to witness the test.

342 8. Injection Survey. Targa should be required to run a tracer and temperature
343 injection survey on this well while injecting water (no acid gas) at a representative
344 rate which approximates the disposal rate and supply the results of that survey to
345 the Division. This survey will help determine what intervals in the large open
346 hole disposal interval will most readily accept water and therefore help in
347 calculation of the plume's radius.

348 9. Mechanical Integrity Test. Targa must demonstrate to the Hobbs District Office
349 that the well has passed a mechanical integrity test.

350 10. Hydrogen Sulfide Contingency Plan. Targa must obtain approval from the
351 Division's Environmental Bureau for a Hydrogen Sulfide Contingency Plan that
352 complies with 19.15.11 NMAC before injecting acid gas.

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354 B. Operational requirements: Once Targa has completed the well to conform

355 to the requirements set out above, has completed the required tests, and has a hydrogen

356 sulfide contingency plan approved by the Division's Environmental Bureau, it should be

357 allowed to commence injection of acid gas, subject to the following additional

358 requirements:

359 1. Disposal volumes. The Commission needs to set a disposal volume limit. Note
360 that Order R-5003 limits the disposal volume for this well to 1500 barrels per day,
361 and the Commission must determine whether it should supersede that order and
362 allow the volume Targa has requested in its application.

363 2. Pressure limits. The initial orders should provide that Targa may inject at 0.3 psi
364 per foot, or 1300 psi. If the results of the step rate test indicate that a higher
365 injection pressure is acceptable, Targa may request an increased pressure limit
366 when it re-opens the case for a determination on the length of the permit term.
367 Future pressure increases on this well should be allowed only after notice to
368 affected persons and hearing. I recommend that the Commission consider
369 requiring Targa to perform an additional injection survey at any higher requested
370 pressure, and that the Commission then consider whether the change in injection
371 pressure will require them to change the time limit of the permit.

372 3. Mechanical Integrity Tests. The annular pressure integrity of this well or MIT
373 test should be done at least once every 5 years or as required by the Hobbs district
374 office.

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376 C. Remedial work. Targa should be required to perform the following

377 remedial work on Legacy Reserves Operating, LP's ("Legacy") Langlie Mattix Penrose

378 Sand Unit Well No. 252 (API No. 30-025-10499), which is located within the Area of

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379 Review: Enter this well and drill out existing plugs down to 4073 feet and then again
380 plug back the well to 3700 feet using cement retainer squeeze cementing or verified
381 cement plugs, under direction of the Hobbs district office.

382 D. Re-opening Case. Within one year of the effective date of the order,
383 Targa should be required to move to re-open Case 14575 for a hearing to determine the
384 time limit for the permit, and if necessary to change the pressure limit. If Targa does not
385 file its motion one year of the effective date of this order, its authority to inject under this
386 order should terminate automatically.

387 At the hearing, Targa should be required to present the following:

- 388 1. Proof that the well has been completed at the permitted depth, with the required
389 tubing, safety valves, meters and pressure gauges in place.
- 390 2. Proof that Targa has obtained approval for its hydrogen sulfide contingency plan
391 from the Division's Environmental Bureau.
- 392 3. Proof that Targa has provided the Division with corrected reports of disposal
393 volumes and disposal pressures for the well, or explain why that information is
394 not available.
- 395 4. Proof that Targa has completed the remedial work on the Legacy Reserves
396 Operating LP Langlie Mattix Penrose Sand Unit Well No. 252.
- 397 5. Results and data from the following:
 - 398 • Electric logs on the open hole interval.
 - 399 • Step rate test.
 - 400 • Tracer and temperature injection survey.
 - 401 • Readings from the meters and pressure gauges for disposal of water and acid
402 gas.
 - 403 • Mechanical integrity test.
- 404 6. Targa's calculation of the time it will take for the acid gas plume to reach ½ mile
405 from the disposal well, incorporating the newly-acquired data.

406 E. Subsequent order. If Targa has not completed the required work or
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408 compiled the required data, the Commission should terminate the permit. If Targa has
409 completed the required work and compiled the required data, the Commission should
410 issue an amendment to its order setting a time limit for the permit based on the evidence
411 presented. The time limit should be based on the time it takes for the calculated, uniform

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412 radius plume to reach ½ mile from this well. At that time, Targa should be required to
413 shut this well in and no further disposal allowed.

414 I further recommend that two years after the effective date of the initial order, if
415 the Commission has not issued a subsequent order addressing the time period for the
416 permit, Targa's authority to inject should terminate automatically.

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418 I, William V. Jones, swear that the foregoing is true and correct.

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425 Subscribed and sworn to before me this 2nd day of December 2010, by William V.
426 Jones.

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430 Notary Public

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432 My commission expires:

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William V. Jones



6/7/2011