FISCAL YEAR 2011 END-OF-YEAR REVIEW
LOUISIANA DEPARTMENT OF NATURAL RESOURCES (LDNR)
OFFICE OF CONSERVATION
UNDERGROUND INJECTION CONTROL (UIC) PROGRAM

EXECUTIVE SUMMARY

This oversight report details the significant accomplishments of Louisiana's Office of Conservation (OC) Injection Mining Division (IMD) in meeting the fiscal year 2011(FY11) UIC grant workplan commitments between July 1, 2010 and June 30, 2011. EPA oversight discussion is presented in the second part of this annual evaluation required in the State/EPA Primacy memorandum of agreement between our agencies. The State UIC program met or exceeded all reporting and targeted field activities within the annual State UIC grant workplan. Included in the UIC grant workplan for the past several years, the fiscal year 2012 (FY12) grant workplan again includes submission of a program revision package for the State Class II program.

FY11 UIC GRANT END-OF-YEAR ACCOMPLISHMENTS:

FY11 STAG Funding—The federal FY11 grant allotment for the State of Louisiana's UIC program administered by the OC is $351,000 in UIC programmatic funds. This allotment was awarded as the annual State and Tribal Assistance Grant (STAG) to OC during FY11.

Workplan Deliverables—Table 1 identifies State program updates and other deliverables submitted pursuant to the FY11 STAG UIC grant workplan. IMD staff submitted to Region 6 all deliverables as mandated in the above referenced workplan. In addition, Table 2 shows the degree of accomplishment for selected program activities targeted in the FY11 UIC grant workplan. LDNR's efforts on these fundamental program activities continue to be impressive.

FISCAL YEAR 2012 (FY12) WORK PLAN NEGOTIATIONS:

Quality Assurance Annual Update—Pursuant to regulatory requirements and policies of EPA, all environmental programs conducted on behalf of EPA will establish and implement effective quality systems. The Quality Management Plan (QMP) and Quality Assurance Project Plan (QAPP) must be updated annually. If both the QMP and QAPP are current and valid, EPA requires each state to annually certify that both plans are current by submitting updated signatory pages and organizational charts as applicable. As part of the FY10 STAG UIC grant workplan, OC staff committed to submit to Region 6 annual quality assurance certifications and new signatory pages before the expiration dates. The current QMP [QTRAK #11-376] was approved by Region 6 on August 16, 2011, and will expire on July 7, 2012. The current QAPP [QTRAK #11-184] was approved by Region 6 on March 23, 2011 and will expire on March 23, 2012.

FY12 UIC STAG Grant Allocation—LDNR was awarded $351,000 in FY2011; this was the final UIC allocation amount for FY2011. No UIC Special Project funds were awarded to LDNR in FY11.

Table 1. Grant deliverables in FY11 UIC Workplan.

Grant Deliverable	Due Date	Date Received
Quarterly Reports (EPA Forms 7520) and Compliance Order Tracking Report	January 31; April 30; July 31; October 31	Submitted on schedule
FY12 Grant Application	May 1, 2011	Application Received—April 18, 2011
FY12 Grant Workplan	May 1, 2011	Workplan Received—April 18, 2011 Approved—April 19, 2011
Final Financial Status Report (FY11)	September 30, 2011	Received & Approved September 13, 2011
Annual UIC Program Report (FY10)	July 30, 2011	July 21, 2011
Update on Program, Regulatory or Statutory Changes	July 30, 2011	July 21, 2011
Annual QMP/QAPP Updates*	QMP	Received—July 14, 2011 Approved—August 16, 2011 Expires—July 7, 2012
	QAPP	Received—March 22, 2011 Approved—March 23, 2011 Expires—March 23, 2012
UIC Well Inventory for FY11	December 31, 2011	December 29, 2011

* The Quality Management Plan (QMP) and Quality Assurance Project Plan (QAPP) are updated annually for tracking any program modifications, concurrences, and/or organizational changes.

Table 2. FY11 Workplan Target and End-of-Year Accomplishments, Program activities and end-of-year level of accomplishment for grant related activities.

Program Activity	Well Class	FY11 Target	Actual End-of-Year Values	Target %
MITs (PART I and II)	I	21	36	Over 100%
	II (SWD & EOR)	800	1,084	Over 100%
	II (Storage)	15	18	Over 100%
	III	15	15	100%
ROUTINE INSPECTIONS	I	78	83	Over 100%
	II (SWD & EOR)	2,000	2,859	Over 100%
	II (Storage)	40	95	Over 100%
	III	20	28	Over 100%
WITNESSED MITs (PART I only)	I	78	78	100%
	II (SWD & EOR)	1,200	1,519	Over 100%
COMPLIANCE REVIEWS **	I	36	36	100%
	II (SWD & EOR)	500	632	Over 100%
	II (Storage)	35	35	100%
	III	25	26	Over 100%

PROGRAM OVERSIGHT DISCUSSION:

State Class II UIC Program Revisions—The Safe Drinking Water Act requires EPA to assure that all State UIC Primacy programs remain effective in protecting underground sources of drinking water. Since many aspects of the State UIC program have changed since the last EPA approved revisions in 1995, submission of a Class II program revision was included as a deliverable in the Louisiana UIC grant workplan for several past fiscal years, including FY2010 and FY2011, and

again in the current FY2012. Therefore, we anticipate receiving a primacy program revision submission for Louisiana Class II injection program during State Fiscal Year 2012.

Class II MITs Performed Compared to UIC Well Inventory—In FY11, OC performed 1,084 two-part mechanical integrity tests (MITs) on Class II wells, including produced water disposal, enhanced recovery, and liquid petroleum storage wells. The first part of an MIT is an external evaluation of the potential for upward migration between the long-string casing and formation, typically an evaluation of a cement bond log by IMD engineer staff. LDNR's seven UIC field inspectors witness the second part MIT, typically a scheduled internal pressure test of the annular space between the tubing, packer, and long-string casing. As previously stated in Table 2, State UIC staff witnessed 1,519 one-part and performed 1,084 two-part MIT evaluations during FY11. Based on the 917 MIT difference between the 4,593 two-part Class II MITs performed during the last five years as compared to the 3.676 inventoried Class II wells for FY11, one can assume that every Class II well in Louisiana was likely evaluated for mechanical integrity at least once during the last five years as required by State UIC regulations.

Table 3. Number of Class II MITs (two-part) conducted between FY2002 and FY2011, annual inventory and variance between number of five-year MITs and annual inventory.

Fiscal Year	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002
Annual MITs (Two-part)	1,084	1,177	825	760	747	777	923	945	690 γ	489
Cumulative MITs Last five-year Σ	4,593	4,286	4,032	4,152	4,082	3,824	3,816	3,711	3,339	3,298
Annual Inventory	3,676	3,731	3,058	ε 3,020	ε 3,004	ε 2,930	ε 3,111	3,137	3,139	3,086
Variance (MITs v. Inventory)	917_	565 _	974	1,132	1,078	894	705	574	200	212

ε State UIC program well inventory of testable Class II wells as of end of state fiscal years, respectively.

_ Variance based on State UIC program well inventory submitted for FY2012 grant formula calculation; 2010 Class II inventory value include UIC-14 disposal wells which are not included in reported UIC MIT values for FY11.

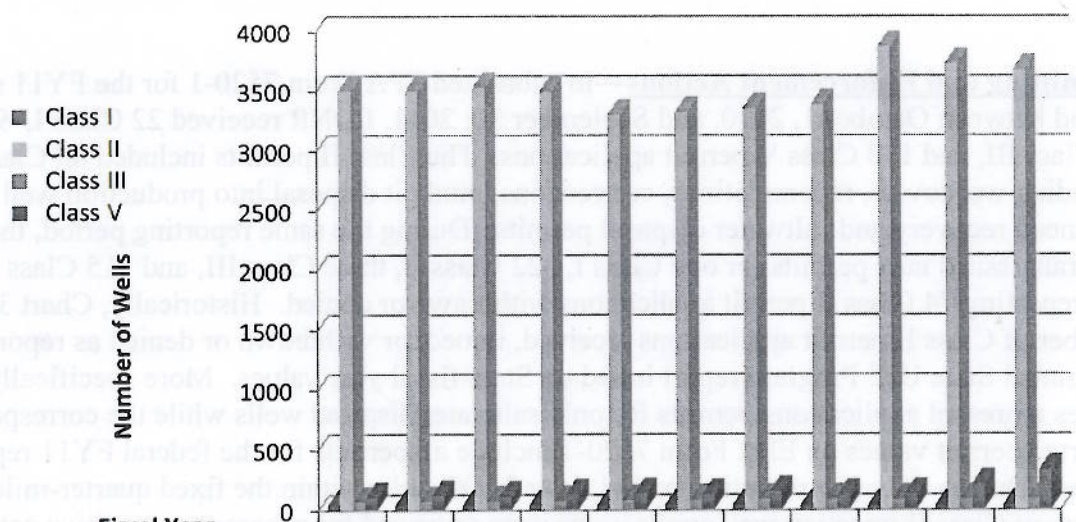
γ Low value partially a result of resignation of an engineering staff member as reported in State annual UIC report, FY 03.

The OC Injection and Mining Division (IMD) historically reports the total UIC well inventory by the various classes of injection/disposal wells as requested by EPA near the end of each calendar year, last reported on December 29, 2011.

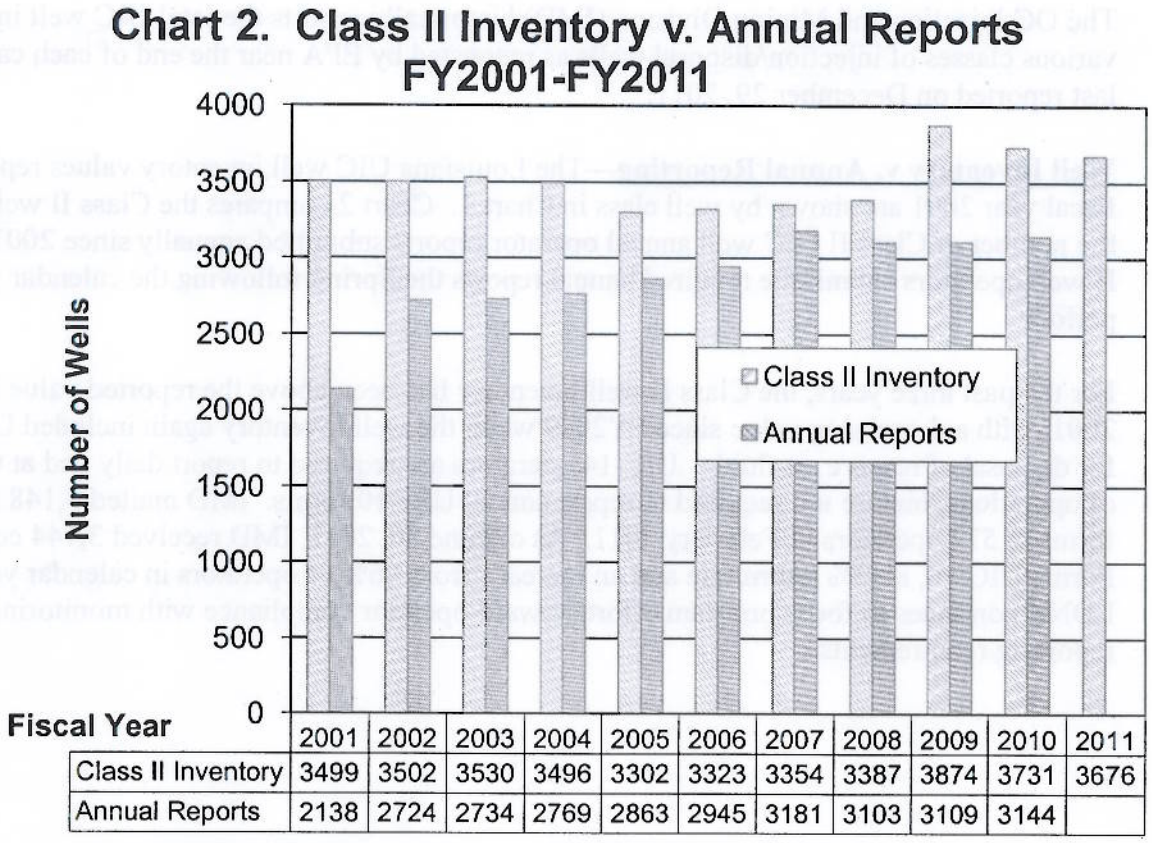
Well Inventory v. Annual Reporting—The Louisiana UIC well inventory values reported since fiscal year 2001 are shown by well class in Chart 1. Chart 2 compares the Class II well inventory to the number of Class II UIC well annual operator reports submitted annually since 2001; most Class II well operators submit the required annual reports the Spring following the calendar year reporting period.

For the past three years, the Class II well inventory has been above the reported value in 2001, with a decreasing value since FY2009 when the well inventory again included UIC-14 permits for disposal of reserve pit fluids. UIC-14 operators are required to report daily and at the conclusion of operations, but are not required to report annual UIC-10 forms. IMD mailed 3,148 reporting forms to 577 operators in February 2011. As of June 30, 2011, IMD received 3,144 completed Forms UIC-10, a 99% return rate and an increase from 96% of operators in calendar year 2009. LDNR continues to focus program efforts toward operator compliance with monitoring and reporting requirements.

Chart 1. Well Class UIC Well Inventory FY2001-FY2011



Fiscal Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Class I	46	43	43	43	43	44	42	40	40	37	38
Class II	3499	3502	3530	3496	3302	3323	3354	3387	3874	3731	3676
Class III	68	72	76	76	85	87	89	88	87	89	89
Class V	106	123	116	136	140	131	155	128	133	213	331



Permitting and Enforcement Actions—In submitted EPA Form 7520-1 for the FY11 reporting period between October 1, 2010, and September 30, 2011, LDNR received 22 Class I, 944 Class II, 45 Class III, and 173 Class V permit applications. The Class II permits included all Class II permits, including workovers, recompletions, conversions, mud pit disposal into production well annuli, enhanced recovery and saltwater disposal permits. During the same reporting period, the State program issued new permits for one Class I, 322 Class II, three Class III, and 115 Class V permits and reporting 74 Class II permit applications withdrawn or denied. Historically, Chart 3 depicts the number of Class II permit applications received, issued, or withdrawn or denied as reported by OC in the annual State UIC Program report based on State fiscal year values. More specifically, Chart 3 values represent applications/permits for only saltwater disposal wells while the corresponding reported permit values on EPA Form 7520-1 include all permits for the federal FY11 reporting period. During the same reporting period, over 3,000 wells within the fixed quarter-mile area of review of Class II injection well applications were reviewed for necessary corrective action. Of those reviewed wells, LDNR identified over 400 Class II wells for corrective action consideration; typical corrective action includes formation pressure monitoring and migration potential (MIGPOT) determination. In addition, injection volume and/or pressure limits may also be used as corrective action.

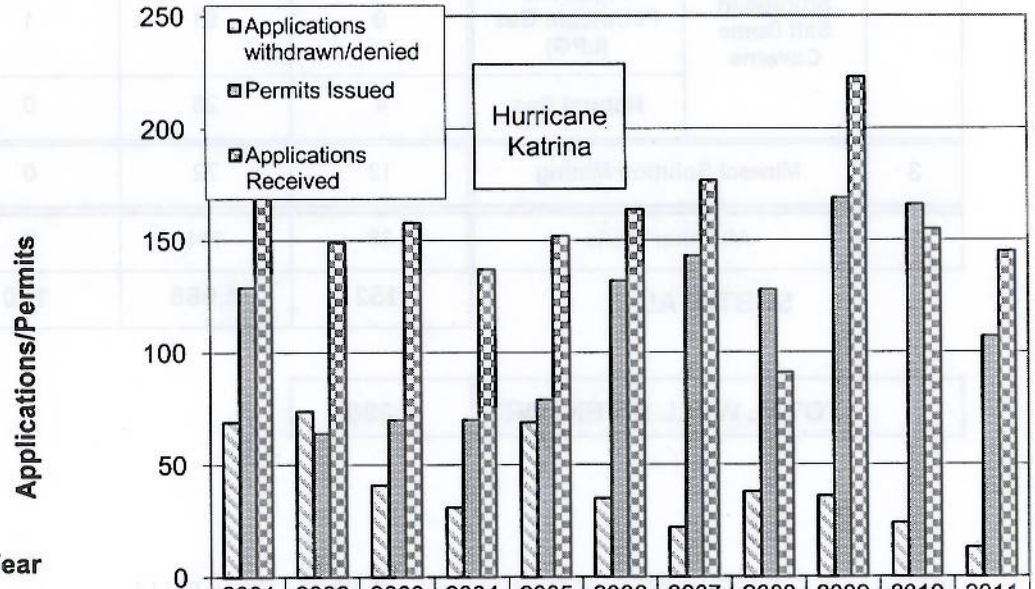
Also from FY11 7520 forms, LDNR staff inspected 36 Class I, 1,884 Class II, 28 Class III, and no Class V wells, with the largest percentage of mechanical integrity failure in the Class II arena. Approximately 13 percent of the Class II tests in FY11 (154 of 1,219 casing and tubing pressure tests) indicated failed mechanical integrity. Previous failure rates in FY10, FY 09, FY08, and FY07

were 16%, 9%, 7%, and 9%, respectively. The percentage of pressure test failures since FY07 range between 7%-16% as expected for Class II injection wells. Only one mechanical integrity test (MIT) failure was reported for 80 Class I well tests in FY11.

UIC violations occurred in only four separate Class I wells (two MIT failure and two monitoring and reporting violations), 363 Class II wells, including 171 reported MIT failures. LDNR staff typically shut-in any well that fails MIT. State reports indicate that LDNR addressed all reported violations with corresponding enforcement action, including notices of violation, administrative orders, and well shut-ins (166 Class II wells shut-in).

Chart 4 shows assessed and collected penalty amounts since fiscal year 2001. The State program reported collecting $58,000 in civil penalties in FY11, an increase from $25,400 collected in FY10.

Chart 3. Class II Permit Activities FY2001-FY2011



Fiscal Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Applications withdrawn/denied	69	74	41	31	69	35	22	38	36	24	13
Permits Issued	129	64	70	70	79	132	143	128	169	166	107
Applications Received	194	149	158	137	152	164	177	91	223	155	145

Table. 4

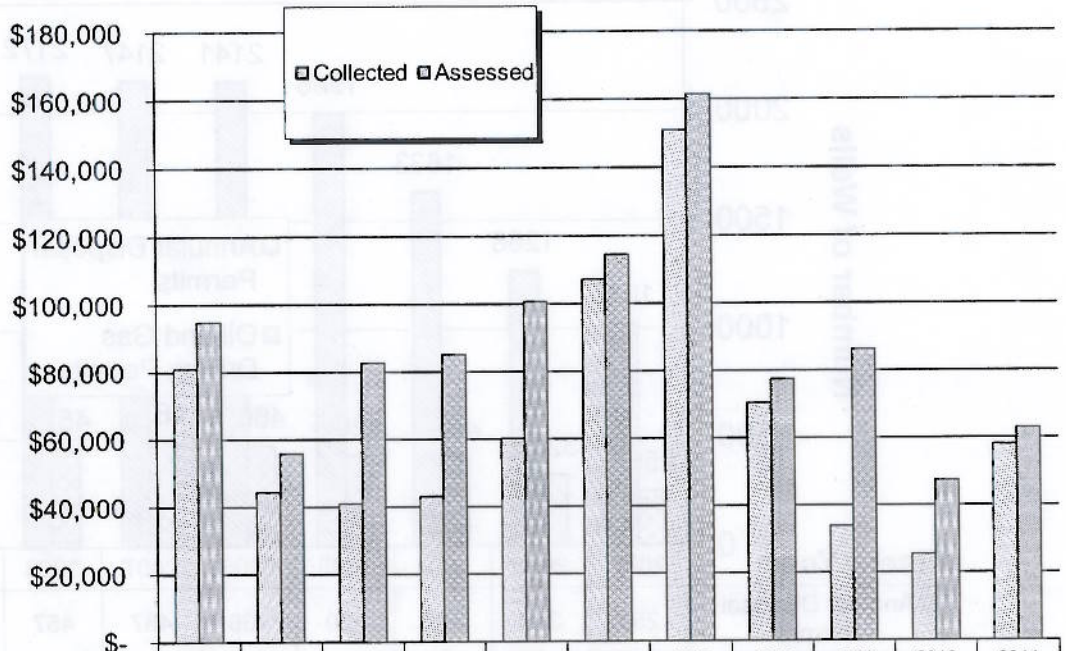
Louisiana Underground Injection Control Program
Injection / Disposal Well Inventory
June 30, 2010

Well Class	Well Type Description		Wells Under Construction	Wells Active	Wells Temporarily Abandoned or Orphaned	Wells Plugged & Abandoned
1	Industrial Hazardous Waste		0	15	1	51
	Industrial NonHazardous Waste		1	21	0	31
2	Saltwater Disposal		77	2,625	141	3221
	Enhanced Oil Recovery		19	504	7	1105
	Reserve Pit Disposal		0	500	0	0
	Hydrocarbon Storage in Salt Dome Caverns	Crude Oil	0	88	0	4
		Liquefied Petroleum Gas (LPG)	0	91	1	14
		Natural Gas	4	26	0	2
3	Mineral Solution Mining		13	72	0	2644
5	All Other Wells		38	144	0	210
	SUBTOTAL		152	4,086	150	

TOTAL WELL INVENTORY	4,388

Source: Louisiana Office of Conservation IMD for State FY11

Chart 4. Penalties and Fines FY2001-FY2011

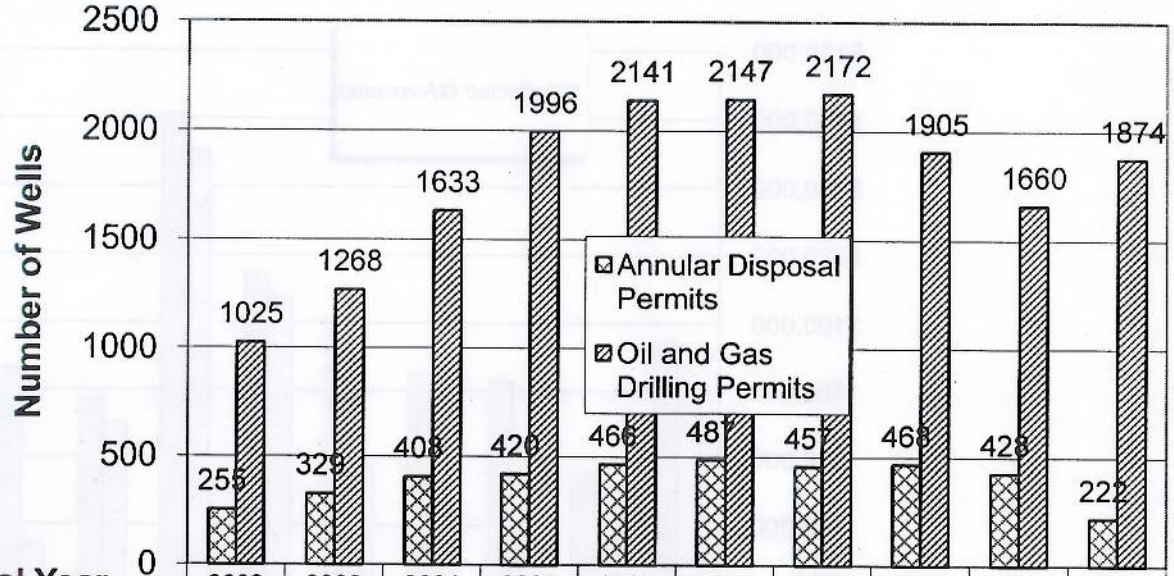


	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Collected	$80,998	$44,400	$40,924	$43,075	$60,200	$107,20	$150,90	$70,450	$33,900	$25,400	$58,000
Assessed	$94,780	$55,900	$82,712	$85,150	$100,70	$114,50	$161,40	$77,450	$86,300	$47,400	$62,900

Subsurface Injection of Drilling Wastes into Production Wells—Since FY2009, the state Injection and Mining Division has included information in annual reports to EPA about its UIC-14 permitting program, including the number of production wells authorized to dispose of reserve pit fluids via annular injection (injection between the surface and long-string casings). EPA recognizes and supports the state's Class II classification of disposal of drilling wastes into production wells. This renewed reporting parameter will assist EPA oversight of drilling waste disposal through fracture slurry injection into production wells. Chart 5 below shows the number of oil and gas production wells permitted between 2002 and 2011 and the number of corresponding State UIC-14 authorizations during the same period.

The number of drilling permits issued during FY11 increased approximately 13% while the number of annular disposal permits decreased proportionately by approximately 49%. Historically, the number of annular mud disposal permits issued each year has ranged from 21% to 25% of the number of oil and gas wells permitted during that same period; for state FY 2011, the percentage is 12%, with 222 UIC-14 permits issued and 265 applications received. (Joe Ball, personal communication) Most likely, operators are recycling drilling muds or re-using the same drilling fluids to drill multiple wells; many shale-gas production wells are drilled horizontally in different directions from the same drill site.

Chart 5. Permitted Oil and Gas Wells versus Authorized Drilling Waste Disposal into Production Wells FY2002-FY2011



Fiscal Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Annular Disposal Permits	255	329	408	420	466	487	457	468	428	222
Oil and Gas Drilling Permits	1025	1268	1633	1996	2141	2147	2172	1905	1660	1874

Oversight Travel and File Reviews Suspended for FY11—EPA Region 6 experienced significant decrease in travel budget funding during FY11 as the entire federal government experienced budget shortfalls. Therefore, no travel funds were available to perform onsite program visits to the State UIC offices or to accompany State UIC inspectors during field exercises. EPA will again review UIC well files for tracked wells in FY12 as travel funds and program resources become available.