Analysis of
EPA's Economic Analysis of Proposed Amendments to 40 CFR Part 171: Certification of Pesticide Applicators

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Executive Summary

The Environmental Protection Agency (EPA) published a report entitled "Economic Analysis of Proposed Amendments to 40 CFR Part 171: Certification of Pesticide Applicators" which describes the agency's "analysis of the costs and benefits of the proposed changes in the regulations governing the Certification of Pesticide Applicators to meet the requirements of Executive Order 12866 on the Regulatory Planning and Review, the Regulatory Flexibility Act as amended by the Small Business Regulatory Enforcement Fairness Act, and the Unfunded Mandates Reform Act." This report is supplemented with Appendices A and B.

The purpose of this paper is to assess the EPA's report; more specifically, the estimated economic costs to Texas pesticide applicators and the state. We replicated all of EPA's economic cost calculations for Texas. For private and commercial applicators, the majority of EPA's estimated costs are tied to the proposed minimum age requirement. After studying the EPA report, we have identified several economic costs that were not taken into account that we believe should be included in order to assess the full economic costs associated with the proposed changes in regulations. For private applicators, these costs include the economic cost of their time and associated travel cost resulting from being away from their business to attend the additional certification trainings resulting from the proposed changes in regulations. For

Table 1. Comparison of Cost Estimates by EPA and Texas A&M AgriLife Extension Service

	EPA Estimated Costs Annualized RIC (a)	Texas A&M AgriLife Extension Service's Estimated Costs Annualized RIC (b)	Texas A&M AgriLife Extension Service's Total Estimated Costs Annualized RIC (c) = (a)+(b)
Private	$106,000	$28,565,577	$28,671,577
Commercial*	$840,000	$29,366,598	$30,206,598
State & Federal Agencies	$8,810	$124,861	$133,671
Total	$954,810	$58,057,036	$59,011,846

*Includes commercial structural, agricultural-landscape services, agricultural-nursery, agricultural-vegetation management, and agricultural-aerial categories. Some of these categories also include non-commercial certifications.

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commercial applicators, these costs also include the economic cost of their time (lost business revenue) and associated travel cost resulting from being away from their business. For the state, the economic costs include the economic cost of Texas A&M AgriLife Extension Service agricultural agents' and specialists' time and increased travel costs resulting from conducting more certification trainings to meet the needs of the proposed changes in regulations.

Table 1 summarizes the incremental cost estimates for Texas made by the EPA, and the Texas A&M AgriLife Extension Service. The EPA report shows a total annualized cost estimate for Texas of $954,810. We estimate an additional $58.0 million in annualized costs, for a total cost of $59.0 million for Texas.

Introduction

The EPA used net present value methodology to estimate the economic costs of their proposed changes to 40 CFR Part 171. This is perfectly acceptable methodology to use for this type of analysis.

Table 2 summarizes EPA's estimate of the economic cost to Texas private applicators. Table 6 shows EPA's estimated cost for commercial applicators and Table 9 summarizes the costs to state and federal agencies. These tables were not found in the EPA report; we developed them by extracting Texas numbers from numerous tables throughout the report and both appendices. These tables only include the costs of categories that have a net cost for Texas. There are many categories (around 40 for commercial) where EPA shows no cost for Texas and these categories are not included in the tables below. Often times, categories have no estimated net cost because Texas is already in compliance with the proposed rule change.

EPA's methodology involves calculating the current cost of the baseline scenario (for each category affected) over multiple years; usually 10 years (some situations involve a 2 year transition period, thus proposal costs are delayed until year 3 of the 10 year timeframe). In most cases, EPA includes estimated implementation costs that are incurred during these first 2 years. Proposal costs in the tables below represent the present value (PV, or net present value, NPV) of 10 years of their projected cost of the proposed changes to the categories on the left. Baseline costs represent the same for the current situation, or baseline. The net cost difference is represented in the NPV difference column. The annual cost is represented in the Annualized RIC (regional incremental cost) column.

Private Applicators

EPA estimates the annual net cost for private applicators at $106,000 annually (statewide) and $938,000 over 10 years (Table 2). The majority of this, $96,000 is associated with the minimum age proposal (incremental labor). Details of this calculation can be found in Tables 3 and 4. We were unable to replicate the $106,000 value exactly; our replication of EPA's calculations resulted in $109,000 (this difference is rather insignificant). We also arrived at $99,289 for incremental labor, rather than EPA's value of $96,000.

Table 2. EPA's Total Incremental Costs of Proposed Requirements for Private Applicators for Texas

				Annualized
	NPV (RC^P)	NPV (RC^B)	NPV Difference	RIC
A. Initial Certification	$16,597,000	$16,577,000	$20,000	$2,000
B. Category Certification	$57,000	$0	$57,000	$6,000
C. PA under Supervision	$1,054,000	$1,047,000	$7,000	$1,000
D. Incremental Labor	$2,336,000	$1,489,000	$847,000	$96,000
E. Recertification	$55,011,000	$55,004,000	$7,000	$1,000
Total	**$75,055,000**	**$74,117,000**	**$938,000**	**$106,000**

For your convenience, EPA describes the number of adolescent private applicators as follows:

As with commercial applicators, CPARD does not provide information on the age of private applicators. Since private applicators are often the owner or operator of a farm, EPA bases its estimates of adolescent applicators on the number of principal operators under the age of 25, as reported in the 2012 Census of Agriculture (NASS, 2014c). We assume a nearly normal distribution, where 0.5 percent of principal operators under the age of 25 are 14 and obtain initial certification as a private applicator, 0.75 percent are 15 and 16 and will be certified, and one percent are 17 years old with certification. This would be an overestimate of principal operators, as the distribution is probably heavily skewed toward operators in their early 20s rather than mid- to late-teens. Further, not all principal operators will be certified applicators since not all farms use pesticides, much less RUPs. However, there are other situations where an adolescent may be a certified operator. Many states have age restrictions, however, typically either 16 or 18 years of age and we adjust our estimates accordingly. Where the minimum age is 16, we assume that all adolescents who would otherwise have obtained certification by that age will do so. Table 3.3-7 presents the estimated adolescent private applicators. Included is an estimate of adolescents hired as a private applicator. The above approach applies to family members only. Hired adolescents on farms is likely very rare. According to the National Agricultural Worker Survey (DoL, 2005), only about 2.3 percent of those handling any kind of pesticide were under 18 and fewer would handle RUPs. We assume that hired 17 year-olds may obtain certification, at a rate of 25 percent of the number of family members obtaining certification at that age.

While this seems like a reasonable estimation of adolescent private applicators, we recognize our somewhat limited knowledge of this topic. Additional thought on this is welcome. EPA estimates the incremental cost for private applicators as follows (Table 3):

Table 3. Calculations for Private applicators under age 18

Baseline Cost for Private Applicator Under Age 18

	Wage	Training Time	Frequency	Cost per Applicator	Number of Applicators	Regional Cost
RUP Applications by 14-15 year old	$25.98	56	1	$1,454.88	9.8	$14,258
RUP Applications by 16-17 year old	$31.18	56	1	$1,746.08	14.5	$25,318
				$3,200.96		$39,576

Proposed Cost for Private Applicator Under Age 18

	Wage	Training Time	Frequency	Cost per Applicator	Number of Applicators	Regional Cost
RUP Applications by 14-15 year old	$25.98	56	1	$1,454.88	3.5	$5,092
RUP Applications by 16-17 year old	$31.18	56	1	$1,746.08	10.6	$18,508
RUP Applications by adult certified	$51.96	56	1	$2,909.76	10.2	$29,680
						$53,280

	Wage	Training Time	Frequency	Cost per Applicator	Number of Applicators	Regional Cost
RUP Applications by 16-17 year old	$31.18	56	1	$1,746.08	10.6	$18,508
RUP Applications by adult certified	$51.96	56	1	$2,909.76	13.7	$39,864
						$58,372

	Wage	Training Time	Frequency	Cost per Applicator	Number of Applicators	Regional Cost
RUP Applications by 14-15 year old	$25.98	56	1	$1,454.88		
RUP Applications by 16-17 year old	$31.18	56	1	$1,746.08	5.3	$9,254
RUP Applications by adult certified	$51.96	56	1	$2,909.76	19.0	$55,285
						$64,540

	Wage	Training Time	Frequency	Cost per Applicator	Number of Applicators	Regional Cost
RUP Applications by 14-15 year old	$25.98	56	1	$1,454.88		
RUP Applications by 16-17 year old	$31.18	56	1	$1,746.08		
RUP Applications by adult certified	$51.96	56	1	$2,909.76	24.3	$70,707

Net Present Value of State Costs

Baseline	$347,873
Proposed	$526,969
NPV Difference	$179,096
Discount Rate	3.00%
Annualized Rate	0.117230507
Annualized RIC	$20,996

For convenience, included here is EPA's description of noncertified adolescent private applicators:

The number of noncertified applicators applying RUPs on farms is likely to be a function of farm size, where farm size is measured by value of sales. Most smaller farms would not need more than one applicator, in general, and even larger farms would probably not have a large enough demand for RUPs that they would need to rely on a certified applicator. We assume that one of every two private applicators on a farm with sales between $100,000 and $1 million per year will have an applicator under his or her supervision to apply RUPs, while private applicators on farms with more than $1 million per year in sales will, on average, have one noncertified applicator under his or her supervision. We obtain the number of farms, by sales, in each state from the 2012 Census of Agriculture (NASS, 2014c). From a special tabulation of data from the 2007 Census of Agriculture (NASS, 2008), we have a national estimate of the proportion of farms in each sales class that utilize pesticides. Using this national figure, we estimate the number of farms in each state that use pesticides. For example, nearly 80 percent of farms with sales between $100,000 and $1 million per year used pesticides in 2007. We therefore estimate that nearly 80 percent of farms in that sales class in every state used pesticides in 2012. In the case of Alabama, this means that we estimate that, out of 3,445 farms with sales between $100,000 and $1 million, 2,753 will use pesticides. Following this procedure with other size classes of farms gives us an estimated 16,630 farms using pesticides. Those in the $100,000 and $1 million sales class account for 16.6 percent of those farms and, we estimate, 16.6 percent of certified applicators. By our previous assumption of half those applicators have someone under their supervision, 8.3 percent of Alabama private applicators will have someone under their supervision. Another 7.0 percent of Alabama private applicators are estimated to be on farms with more than $1 million in sales and will have someone applying RUPs under their supervision. Therefore, we estimate that the number of noncertified applicators in Alabama is 15.3 percent of the 5,402 certified private applicators, or 827 noncertified applicators. Table 3.3-10 presents estimates for all the states and jurisdictions.

Finally, we estimate the number of noncertified adolescents that may apply RUPs under the direct supervision of a private applicator.

To estimate the number of noncertified adolescent family members who might apply RUPs under the direct supervision of certified private applicators, we follow a procedure similar to that of estimating adolescent certified private applicators. In this case, we base the estimates on the number of second and third farm operators under the age of 25, as reported in the 2012 Census of Agriculture (NASS, 2014c). We again assume a nearly normal distribution, where 0.5 percent of second and third operators under the age of 25 are 14, 0.75 percent are 15 and 16, and one percent are 17 years old.

To estimate the number of noncertified non-family adolescents applying RUPs under the direct supervision of a certified private applicator, we rely on data from the National Agricultural Worker Survey (DoL, 2005). According to the survey, 0.4 percent of pesticide

handlers were under 16 and 1.9 percent 16 and 17 year old. We multiply these percentages by the total number of applicators UTS in each state to obtain the estimates shown in Table 3.3-10.

Finally, some states have age restrictions precluding adolescents from applying RUPs. This is shown in Table 3.3-10 where there are zero adolescent noncertified applicators. The exception is Alaska, which does not have a restriction but where our procedure above resulted in an estimated zero applicators younger than 16 years of age.

While this seems like a reasonable estimation of adolescent private applicators, we recognize our somewhat limited knowledge of this topic. Additional thought on this is welcome. EPA estimates the incremental cost for non-certified adolescent private applicators as follows (Table 4), with the total cost for incremental labor in Table 5.

Table 4. Calculations for Non-certified private applicators applying RUPs under the supervision of a certified private applicator

Baseline Cost for Private Applicator Under Age 18

	Wage	Training Time	Frequency	Cost per Applicator	Number of Applicators	Regional Cost
RUP Applications by 14-15 year old	$10.75	56	1	$602.00	57.4	$34,555
RUP Applications by 16-17 year old	$12.89	56	1	$721.84	58.9	$42,516
RUP Applications by 16-17 year old	$12.89	56	1	$721.84	73.1	$52,767
						$129,838

Proposed Cost for Private Applicator Under Age 18

	Wage	Training Time	Frequency	Cost per Applicator	Number of Applicators	Regional Cost
RUP Applications by 14-15 year old	$21.49	56	1	$1,203.44	57.4	$69,077
RUP Applications by 16-17 year old	$21.49	56	1	$1,203.44	58.9	$70,883
RUP Applications by 16-17 year old	$21.49	56	1	$1,203.44	73.1	$87,971
						$227,932

Net Present Value of State Costs

Baseline	$1,141,273
Proposed	$1,809,134
NPV Difference	$667,860
Discount Rate	3.00%
Annualized Rate	0.117230507
Annualized RIC	$78,294

Table 5. Summary of Net Present Value of Costs for Minimum Wage Requirements

Baseline	$1,489,146
Proposed	$2,336,102
NPV Difference	$846,956
Discount Rate	3.00%
Annualized Rate	0.117230507
Annualized RIC*	$99,289
* Page 19 of 55 in EPA Appendix B shows $96,000	

Commercial Applicators

EPA estimates the cost for commercial applicators in Texas at $840,000 annually and $7.37 million over 10 years (Table 6). As with private applicators, the largest portion of this cost is associated with the minimum age rule (incremental labor). The minimum age rule (incremental labor) accounts for $837,000 of the $840,000 annual cost to commercial applicators in Texas.

Table 6. EPA's Total Incremental Costs of Proposed Requirements for Commercial Applicators for Texas

	NPV (RC^P)	NPV (RC^B)	NPV Difference	Annualized RIC
A. Initial Certification	$0	$0	$0	$0
B. Category Certification	$726,000	$726,000	$0	$0
C. CA under Supervision	$13,614,000	$13,592,000	$22,000	$3,000
D. Incremental Labor	$35,817,000	$28,464,000	$7,353,000	$837,000
E. Recertification	$25,205,000	$25,205,000	$0	$0
Total	**$75,362,000**	**$67,987,000**	**$7,375,000**	**$840,000**

EPA describes their estimation of the number of commercial adolescent applicators as follows:

Data on the age distribution of certified applicators is not available. Because it is important to know the number of certified applicators that may be subject to an age restriction, EPA estimates the number of commercial applicators. Due to restrictions on adolescents regarding driving, and the availability to work due to education requirements, as well as general liability concerns, it is unlikely that there are commercial applicators under the age of 16. For those that are 16-17 years old, EPA assumes that 0.2 percent of new commercial applicators are 16 years old and 0.3 percent are 17 years old. This assumption follows the analysis of the Proposed Revisions to the Worker Protection Standard (EPA, 2014a). Data from the National

Agricultural Worker Survey (DoL, 2005) indicated that just over two percent of on-farm pesticide handlers were under 18 years of age. EPA assumed that commercial pesticide handling establishments would be less likely to employ adolescents in such a capacity and estimated that about one percent of commercial handlers would be under 18. Here, we assume it is even less likely that commercial establishments would hire adolescents to apply RUPs. Further, 33 states prohibit certification for those under 18.

The estimated number of commercial certified adolescents under age 18 and associated cost calculations are demonstrated in Table 7.

Table 7. Calculations for Commercial applicators under age 18

Private Age-01: Minimum Age of 16

Baseline Cost for Commercial Applicator Under Age 18 (RCb)

	Wage	Hours worked/yea	Frequency	Cost per Applicator	Number of Applicators	Regional Cost	
16-17 1st time	$16.12	448	1	$7,221	8.5	$61,375	
16 1st time (3.4) + age 17 existing (5.1)	$16.12	448	1	$7,221	3.1	$22,384	
				$14,441		$83,759	matche

Proposed Cost for Commercial Applicator Under Age 18 (t=3)

Appendix A: pg 288, EPA shows 16-17 1st time = 8.5 actors, 17 existing = 3.1 actors.

	Wage	Hours worked/yea	Frequency	Cost per Applicator	Number of Applicators	Regional Cost	
16-17 existing x adolescent cost	$16.12	448	1	$7,221	3.1	$22,384	
16-17 1st time x proposed cost	$21.49	448	1	$9,628	8.5	$81,834	
NA	$0.00	0	0	$0	0.0	$0	
						$104,218	matche

Proposed Cost for Commercial Applicator Under Age 18 (t>3)

	Wage	Hours worked/yea	Frequency	Cost per Applicator	Number of Applicators	Regional Cost	
NA	$21.49	448	1	$9,628	6.5	$62,579	
NA	$21.49	448	1	$9,628	5.1	$49,100	
						$111,679	matche

This stuff is in Appendix B

Net Present Value of State Costs

Baseline	$736,245
Proposed	$918,528
NPV Difference	$182,283
Discount Rate	3.00%
Annualized Rate	0.117230507
Annualized RIC	$21,369

For convenience, included here is EPA's description of the number of noncertified adolescent applicators applying RUPs under the direct supervision of a certified applicator:

The number of noncertified adolescents applying RUPs under the direct supervision of a certified applicator is also of interest, given that EPA is proposing a minimum age. According to the Current Population Survey (BLS, 2014a), in 2013, about 77,000 people were employed in pest control occupations within the category of Building and Grounds Cleaning and Maintenance, of which 1,000 were aged 16 to 19, or 1.3 percent of the workforce. This category is representative of the turf and ornamental and the industrial, institutional, and structural category which houses the majority of certified applicators. We therefore apply this percentage across all states to estimate the number of noncertified 16 and 17 year olds applying RUPs under the direct supervision of a commercial applicator. Since the BLS data includes 18 and 19 year olds, we are likely overestimating the number of adolescents applying RUPs. Several states have set a minimum age of 18 for applying RUPs, as shown by the estimated zero adolescents in the state.

While this seems like a reasonable estimation of non-certified adolescent commercial applicators, we recognize our somewhat limited knowledge of this topic. As we previously discussed, we do question the 55,148 estimate for the number of non-certified commercial applicators applying RUPs UTS of certified commercial applicators that 1.3% is applied to for estimating the number of non-certified applicators age 16-17. Additional thought on this is welcome. EPA's estimate for the incremental cost for non-certified adolescent commercial applicators is demonstrated in Table 8.

Table 8. Calculations for Non-certified (NC) commercial applicators under age 18

Comm. NC applying RUPS under supervision (min wage)

Baseline Cost for Comm NC Applicator Under Age 18

	Wage	Training Time	Frequency	st per Applica	Number of Applicators	Regional Cost
Under 18	$13.76	320	1	$4,403.20	717.0	$3,157,094
Adult comm applicator	$0.00	0	0	$0.00	0.0	$0
						$3,157,094

Proposed Cost for Comm Applicator Under Age 18

	Wage	Training Time	Frequency	st per Applica	Number of Applicators	Regional Cost	
Adult comm applicator	$18.34	320	1	$5,868.80	717.0	$4,207,930	
RUP Applications by 16-17 year old certi	$0.00	0	1	$0.00	0.0	$0	
RUP Applications by adult certified priv	$0.00	0	1	$0.00	0.0	$0	
						$4,207,930	RC t=3

	Wage	Training Time	Frequency	st per Applica	Number of Applicators	Regional Cost	
RUP Applications by 16-17 year old certi	$0.00	56	1	$0.00	10.6	$0	
RUP Applications by adult certified priv	$0.00	56	1	$0.00	13.7	$0	
						$0	RC t=4

	Wage	Training Time	Frequency	st per Applica	Number of Applicators	Regional Cost	
RUP Applications by 14-15 year old certi	$0.00	56	1	$0.00			
RUP Applications by 16-17 year old certi	$0.00	56	1	$0.00	5.3	$0	
RUP Applications by adult certified priv	$0.00	56	1	$0.00	19.0	$0	
						$0	RC t=5

	Wage	Training Time	Frequency	st per Applica	Number of Applicators	Regional Cost	
RUP Applications by 14-15 year old certi	$0.00	56	1	$0.00			
RUP Applications by 16-17 year old certi	$0.00	56	1	$0.00			
RUP Applications by adult certified priv	$0.00	56	1	$0.00	24.3	$0	RC t>5

Net Present Value of State Costs

Baseline	$27,750,860
Proposed	$34,917,556
NPV Difference	$7,166,696
Discount Rate	3.00%
Annualized Rate	0.113899717
Annualized RIC	$816,285

Cost to the State of Texas

EPA estimates the cost to Texas at $8,810 annually, and $76,800 over 10 years. The largest portion of this cost is associated with the administering of exams and trainings which accounts for $3,600 in annualized costs for Texas (Table 9).

Table 9. EPA Total Incremental Costs for State, Other Jurisdictions, and Federal Agencies (Government Entities) of Proposed Requirements

	NPV (RC^P)	NPV (RC^B)	NPV Difference	Annualized RIC
A. Revising State Plans	$20,000	$0	$20,000	$2,280
B. Submitting Revised Plans	$600	$0	$600	$70
C. Developing Teaching Materials	$19,000	$0	$19,000	$2,160
D. EPA Costs for Reviewing Exams	$6,200	$0	$6,200	$700
Total	**$45,800**	**$0**	**$45,800**	**$5,210**
D. Administering Exams/Trainings	$114,000	$83,000	$31,000	$3,600
Total			**$76,800**	**$8,810**

Economic Costs Not Included in EPA Report

Private and Commercial Applicators

From Texas' perspective, there are several areas of costs that are not included in the EPA cost estimates. Based in the EPA report, there are no cost estimates for lost business revenue and travel expenses that would result from commercial structural applicators and agricultural applicators having to leave their business to attend additional trainings. Further, there is no cost estimate for the time and travel for private applicators to attend additional certification trainings.

We estimated the costs for the lost business revenue, travel costs, and the cost of time away for private, commercial-structural, and agricultural applicators. These costs are summarized in Table 10 below, followed by a description of our methodology used in estimating these costs for each category.

Table 10. Summary Table for Proposed Cost of EPA Proposed Requirements (Texas)			
		NPV	Annualized
	Cost	RIC	RIC
Private Applicators	Value of lost time, travel cost	$250,980,301	$28,565,577
Commercial Applicators			
Structural	Lost business revenue, travel cost	$31,536,315	$3,589,338
Agricultural - Landscape Services*	Lost business revenue, travel cost	$41,511,262	$4,724,646
Agricultural - Nursery*	Lost business revenue, travel cost	$2,157,764	$245,588
Agricultural - Vegetation Management*	Lost business revenue, travel cost	$32,821,493	$3,735,611
Agricultural - Aerial*	Lost business revenue, travel cost	$149,991,331	$17,071,415
Total		**$508,998,464**	**$57,932,175**
* Agricultural applicators in Texas include commercial, non-commercial, and non-commercial political.			
** Totals may not sum up due to rounding			

Private Applicators

Another area of concern is the cost of time and travel costs associated with private applicators having to participate in additional trainings. The EPA report estimates the cost to private applicators in Texas at $106,000; $96,000 of which is tied to the proposed minimum age requirement. What is not reflected in this cost estimate is that the additional certification requirements will cause private applicators to be away from their business an additional 2 days each year. Table 11 outlines the data and assumptions we used to estimate the additional cost of the proposed increase in certification requirements.

Table 11. Estimate of lost wages for private applicators			
No. of private applicators			43,104
No. of business days lost			2.0
Work hours/day			8.0
Wage rate for private applicators (from EPA report)			$51.96
Average wage value/day			$416
Number of applicators traveling to trainings			43,104
Average round trip miles traveled			40
IRS Mileage rate*			$0.575
* assume same mileage rate for years 3-10			

Using the data and assumptions above, value of time is estimated at $35.8 million per year; mileage cost (travel) is estimated at $991,392 per year, for a total cost of $36.8 million (Table 12). Primarily to be on the conservative side, no costs for hotel or per diem is included. Considering there is a 2-year implementation period, these costs would occur in years 3 through 10. The net present value of these costs over 10 years (8 of the 10 years) is $250.9 million while the annualized cost is $28.5 million (Tables 10 and 12).

Rather than estimating the baseline costs as EPA did in their analyses, we looked at only the additional cost of the proposal since it is additive to the baseline. It is not necessary to have a baseline costs in this particular situation.

Table 12. Calculations for Private Applicators Time

Proposed Value of Private Applicators' Lost Time

	Value of Time Per Day	Days Lost/Yr	Revenue	Number of Applicators	Regional Cost
Private applicator time	$416	2.0	$831	43,104	$35,834,941

Proposed Mileage Cost

	Average Miles Traveled Round Trip	IRS Mileage Rate	Travel Cost Per Applicator	Number of Applicators	Regional Cost
Private mileage cost	40	$0.575	$23	43,104	$991,392
					$36,826,333

Net Present Value of State Costs

Baseline	$0
Proposed	$250,980,301
NPV Difference	$250,980,301
Discount Rate	3.00%
Annualized Rate	0.113816012
Annualized RIC	$28,565,577

Commercial Applicators

The first area of concern in what EPA calls "Comm Recert-01: Exam or 6-hour training for commercial core competency and category recertification, at least every three years" (see Table 5.4-1, page 124 and 125 of EPA report).

The following can be found on page 361 of EPA's Appendix A, and describes how EPA estimated the baseline costs for Comm Recert-01.

Texas

Recertification requirements:

- Requirement varies depending on category of certification; must complete requirements for each category certification held:
  - Ag Plant, Ag Animal, Forest, Seed Treatment, Aquatic, Right-of-Way, Public Health, Regulatory, Demonstration/Research:
    - 5 CEUs of 60 minutes, or 5 hours, per category of certification to recertify for the specific category (option to retake initial exam for each category)
  - Ornamental/Turf, Industrial/Institutional:
    - 3 CEUs (2 core + 1 cat) of 60 minutes, or 3 hours, per category of certification to recertify for the specific category (option to retake initial exams for specific categories)
- EPA assumes the option of exam is equivalent in effort to obtaining CEUs
- Period is 1 year for all categories ($freq_{i,t} = 1.0$)
- Average number of category certifications per commercial applicator in state:
  - Ag Plant, *etc*: 0.803
  - Ornamental/Turf, *etc*: 1.207

Annual Baseline Cost per Commercial Applicator for Recertification – Texas

Action	Wage ($)	Time (hours)	Frequency (per year)	Avg # cat. certs per applicator	Cost ($)
Recert – Ag Plant, etc	21.49	5	1	0.803	86.33
Recert – Ornamental/Turf, etc	21.49	3	1	1.207	77.80
Total					164.13

The following table can be found on page 373 of EPA's Appendix A.

Texas

Comm Recert-01, Potential Requirement Cost per Commercial Applicator; Texas

Action	Wage ($)	Time (hours)	Frequency (per year)	Avg # cat. certs per applicator	Cost ($)
Recert – core	21.49	6	0.333	1.0	42.98
Recert – categories	21.49	6	0.333	2.010	86.40
Total					**129.38**

For the total cost of the baseline, EPA multiplied the baseline cost per applicator ($164.13) times the total number of existing commercial applicators (17,478) to arrive at a total baseline cost of Comm Recert-01 of $2.86 million.

For the potential cost of this requirement, EPA multiplied the maximum of the potential cost per applicator, and the baseline cost per applicator ($164.13 vs. $129.38) times 17,478 to arrive at a total potential cost of Comm Recert-01 of $2,868,702; resulting in a net cost of zero for this proposed change in regulation. For the potential costs, had EPA not taken the maximum of these two cost figures - and used the potential cost per applicator of $129.38, they would have actually showed a cost savings (rather than a cost increase) associated with Comm Recert-01. The cost savings would have been $607,398 ($2,868,702 - $2,261,304).

Based on our conversations with Texas A&M AgriLife Extension Service, Agricultural and Pesticide Safety faculty, this proposed requirement change would have the following effects:

Over a 3 year cycle an applicator with 2 categories would need to have 1 additional CEU in the specific category in which they are licensed. The average commercial pest control applicator has 2 categories (pest and termite). Currently, they are required to have 2 CEUs in general (Laws & Regulations, IPM, Safety, Business Ethics) and 1 CEU per category (1 for pest and 1 for termites) for a total of 4 CEUs per year. Under the current rule, 12 CEUs are required every three years for the average applicator. However, for applicators with more than 2 categories, the burden under the proposed regulations will quickly expand the recertification requirements and the associated business costs escalate accordingly.

On average, the proposals would require 1 extra day per year during the 3 year recertification cycle for businesses to comply. You have to consider the lost business opportunities (up to $800.00 per applicator/day on average, although we used a conservative $500/applicator/day in our estimate below), in addition to the added business costs (travel, fuel, possible lodging and per diem charges.

Considering these effects, we propose the following methodology for estimating the economic costs associated with Comm Recert-01 (Table 13). This methodology involves estimating business revenue lost due to the applicator being away from the business attending additional certification trainings resulting from the proposed changes in regulations. This methodology also includes estimated travel costs.

Table 13. Estimate of lost business revenue for structural applicators			
No. of structural applicators			8,151
No. of business days lost			1.0
Average business revenue/day			$500
Number of applicators traveling to trainings			8,151
Average round trip miles traveled			60
IRS Mileage rate*			$0.575
*assume same mileage rate for years 3-10			
Percent that lodge overnight in hotel			20.0%
Hotel rate (including occupancy and sales tax)			$120
For overnight stays, number of days traveling			1.0
Per diem cost (per day) for overnight travelers			$46

We used average revenue per day of $500 for structural applicators. While we are not aware of any published data on gross revenue for structural applicators, we consider this to be a very conservative estimate based on our knowledge of the industry. Using the data and assumptions above, business revenue lost is estimated at $4.07 million per year; mileage cost (travel) is estimated at $281,210 per year, hotel lodging is estimated at $195,624 per year, and per diem cost is estimated at $74,989 per year; for a total cost of $4.62 million (Table 14). Considering there is a 2-year implementation period, these costs would occur in years 3 through 10. The net present value of these costs over 10 years (8 of the 10 years) is $31.5 million, while the annualized cost is $3.5 million (Tables 10 and 14).

Rather than estimating the baseline costs as EPA did in their analyses, we looked at only the additional cost of the proposal since it is additive to the baseline. It is not necessary to have a baseline costs in this particular situation.

Table 14. Calculations for Lost Business Revenue for Structural Applicators

Proposed Revenue Lost for Commercial Applicator Structural (Landscape Services)

	Revenue Per Day	Days Lost/Yr	Revenue	Number of Applicators	Regional Cost
Landscape Services (Structural) revenue (single day)	$500	1.0	$500.00	6,521	$3,260,400
Landscape Services (Structural) revenue (overnight stay)	$500	1.0	$500.00	1,630	$815,100
Total				8,151	$4,075,500

Proposed Mileage Cost (Travel Cost) for Commercial Applicator Structural (Landscape Services)

	Average Miles Traveled Round Trip	IRS Mileage Rate	Travel Cost Per Applicator	Number of Applicators	Regional Cost
Landscape Services (Structural) mileage cost	60	$0.575	$35	8,151	$281,210

Proposed Mileage Hotel and Per Diem Cost for Commercial Applicator Structural (Landscape Services)

	Hotel Rate/Night	No. of Nights	No. of Days	Travel Cost Per Applicator	Number of Applicators	Regional Cost
Landscape Services (Structural) hotel cost	$120	1		$120	1,630	$195,624
Landscape Services (Structural) per diem cost	$46		1.0	$46	1,630	$74,989
Total						$270,613
						$4,627,323

Net Present Value of State Costs

Baseline	$0
Proposed	$31,536,315
NPV Difference	$31,536,315
Discount Rate	3.00%
Annualized Rate	0.113816012
Annualized RIC	$3,589,338

Agricultural Applicators – Landscape Services

Another area of concern is the cost of lost time and travel costs associated with agricultural applicators – landscape services having to participate in additional trainings. The additional certification requirements will cause agricultural applicators – landscape services to be away from their business an additional 2 days each year. Table 15 outlines the data and assumptions used to estimate the additional cost of the proposed increase in certification requirements.

Table 15. Estimate of lost business revenue for agricultural applicators - landscape services

No. of agricultural applicators - landscape			5,656
No. of business days lost			2.0
Average business revenue/day			$500
Number of applicators traveling to trainings			5,656
Average round trip miles traveled			60
IRS Mileage rate*			$0.575
*assume same mileage rate for years 3-10			
Percent that lodge overnight in hotel			20.0%
Hotel rate (including occupancy and sales tax)			$120
For overnight stays, number of days traveling			2.0
Per diem cost (per day) for overnight travelers			$46

We used average revenue per day of $500 for landscape services applicators. While we are not aware of any published data on gross revenue for landscape services applicators, we consider this to be a very conservative estimate based on our knowledge of the industry. Using the data and assumptions above, business revenue lost is estimated at $5.6 million per year; mileage cost (travel) is estimated at $195,132 per year, hotel lodging is estimated at $135,744 per year, and per diem cost is estimated at $104,070 per year; for a total cost of $6.0 million (Table 16). Considering there is a 2-year implementation period, these costs would occur in years 3 through 10. The net present value of these costs over 10 years (8 of the 10 years) is $41.5 million while the annualized cost is $4.7 million (Tables 10 and 16).

Rather than estimating the baseline costs as EPA did in their analyses, we looked at only the additional cost of the proposal since it is additive to the baseline. It is not necessary to have a baseline costs in this particular situation.

Table 16. Calculations for Lost Business Revenue for Ag. Applicators – Landscape Services

Proposed Revenue Lost for Commercial Applicator Agricultural (Landscape Services)

	Revenue Per Day	Days Lost/Yr	Revenue	Number of Applicators	Regional Cost
Landscape Services (Agricultural) revenue (single day)	$500	2.0	$1,000.00	4,524.8	$4,524,800
Landscape Services (Agricultural) revenue (overnight stay	$500	2.0	$1,000.00	1,131.2	$1,131,200
Total				5,656.0	$5,656,000

Proposed Mileage Cost (Travel Cost) for Commercial Applicator Agricultural (Landscape Services)

	Average Miles Traveled Round Trip	IRS Mileage Rate	Travel Cost Per Applicator	Number of Applicators	Regional Cost
Agriculture (Landscape Services) mileage	60	$0.575	$35	5,656.0	$195,132

Proposed Mileage Hotel and Per Diem Cost for Commercial Applicator Agricultural (Landscape Services)

	Hotel Rate/Night	No. of Nights	No. of Days	Travel Cost Per Applicator	Number of Applicators	Regional Cost
Agriculture (Landscape Services) hotel	$120	1		$120	1,131.2	$135,744
Agriculture (Landscape Services) per diem	$46		2.0	$92	1,131.2	$104,070
Total						$239,814
						$6,090,946

Net Present Value of State Costs

Baseline	$0
Proposed	$41,511,262
NPV Difference	$41,511,262
Discount Rate	3.00%
Annualized Rate	0.11381601
Annualized RIC	$4,724,646

Agricultural Applicators - Nursery

Another area of concern is the cost of lost time and travel costs associated with agricultural applicators – nursery having to participate in additional trainings. The additional certification requirements will cause agricultural applicators – nursery to be away from their business an additional 2 days each year. Table 17 outlines the data and assumptions used to estimate the additional cost of the proposed increase in certification requirements.

Table 17. Estimate of lost business revenue for agricultural applicators - nursery

No. of agricultural applicators - nursery			294
No. of business days lost			2.0
Average business revenue/day			$500
Number of applicators traveling to trainings			294
Average round trip miles traveled			60
IRS Mileage rate*			$0.575
*assume same mileage rate for years 3-10			
Percent that lodge overnight in hotel			20.0%
Hotel rate (including occupancy and sales tax)			$120
For overnight stays, number of days traveling			2.0
Per diem cost (per day) for overnight travelers			$46

We used average revenue per day of $500 for agricultural applicators - nursery. While we are not aware of any published data on gross revenue for nursery applicators, we consider this to be a very conservative estimate based on our knowledge of the industry. Using the data and assumptions above, business revenue lost is estimated at $294,000 per year; mileage cost (travel) is estimated at $10,143 per year, hotel lodging is estimated at $7,056 per year, and per diem cost is estimated at $5,410 per year; for a total cost of $316,609 (Table 18). Considering there is a 2-year implementation period, these costs would occur in years 3 through 10. The net present value of these costs over 10 years (8 of the 10 years) is $2.1 million while the annualized cost is $245,588 (Tables 10 and 18).

Rather than estimating the baseline costs as EPA did in their analyses, we looked at only the additional cost of the proposal since it is additive to the baseline. It is not necessary to have a baseline costs in this particular situation.

Table 18. Calculations for Lost Business Revenue for Ag. Applicators - Nursery

Proposed Revenue Lost for Commercial Applicator Agricultural (Nursery)

	Revenue Per Day	Days Lost/Yr	Revenue	Number of Applicators	Regional Cost
Nursery (Agricultural) revenue (single day)	$500	2.0	$1,000.00	235.2	$235,200
Nursery (Agricultural) revenue (overnight stay)	$500	2.0	$1,000.00	58.8	$58,800
Total				294.0	$294,000

Proposed Mileage Cost (Travel Cost) for Commercial Applicator Ag (Nursery)

	Average Miles Traveled Round Trip	IRS Mileage Rate	Travel Cost Per Applicator	Number of Applicators	Regional Cost
Nursery (Agricultural) mileage cost	60	$0.575	$35	294.0	$10,143

Proposed Mileage Hotel and Per Diem Cost for Commercial Applicator Ag (Nursery)

	Hotel Rate/Night	No. of Nights	No. of Days	Travel Cost Per Applicator	Number of Applicators	Regional Cost
Nursery (Agricultural) hotel cost	$120	1		$120	58.8	$7,056
Nursery (Agricultural) per diem cost	$46		2.0	$92	58.8	$5,410
Total						$12,466
						$316,609

Net Present Value of State Costs

Baseline	$0
Proposed	$2,157,764
NPV Difference	$2,157,764
Discount Rate	3.00%
Annualized Rate	0.113816012
Annualized RIC	$245,588

Agricultural Applicators – Vegetation Management

Another area of concern is the cost of lost time and travel costs associated with agricultural applicators – vegetation management having to participate in additional trainings. The additional certification requirements will cause agricultural applicators – vegetation management to be away from their business an additional 2 days each year. Table 19 outlines the data and assumptions used to estimate the additional cost of the proposed increase in certification requirements.

Table 19. Estimate of lost business revenue for agricultural applicators - vegetation management

No. of agricultural applicators - vegetation			4,472
No. of business days lost			2.0
Average business revenue/day			$500
Number of applicators traveling to trainings			4,472
Average round trip miles traveled			60
IRS Mileage rate*			$0.575
*assume same mileage rate for years 3-10			
Percent that lodge overnight in hotel			20.0%
Hotel rate (including occupancy and sales tax)			$120
For overnight stays, number of days traveling			2.0
Per diem cost (per day) for overnight travelers			$46

We used average revenue per day of $500 for agricultural applicators – vegetation management. While we are not aware of any published data on gross revenue for agricultural vegetation applicators, we consider this to be a very conservative estimate based on our knowledge of the industry. Using the data and assumptions above, business revenue lost is estimated at $4.4 million year; mileage cost (travel) is estimated at $154,284 per year, hotel lodging is estimated at $107,328 per year, and per diem cost is estimated at $82,285 per year; for a total cost of $4.8 million (Table 20). Considering there is a 2-year implementation period, these costs would occur in years 3 through 10. The net present value of these costs over 10 years (8 of the 10 years) is $32.8 million while the annualized cost is $3.7 million (Tables 10 and 20) .

Rather than estimating the baseline costs as EPA did in their analyses, we looked at only the additional cost of the proposal since it is additive to the baseline. It is not necessary to have a baseline costs in this particular situation.

Table 20. Calculations for Lost Business Revenue for Ag. Applicators – Vegetation Management

Proposed Revenue Lost for Commercial Applicator Agricultural (Vegetation Management)

	Revenue Per Day	Days Lost/Yr	Revenue	Number of Applicators	Regional Cost
Vegetation Management (Agricultural) revenue (single day)	$500	2.0	$1,000	3,577.6	$3,577,600
Vegetation Management (Agricultural) revenue (overnight stay)	$500	2.0	$1,000	894.4	$894,400
Total				4,472.0	$4,472,000

Proposed Mileage Cost (Travel Cost) for Commercial Ag (Veg Mgmt)

	Average Miles Traveled Round Trip	IRS Mileage Rate	Travel Cost Per Applicator	Number of Applicators	Regional Cost
Vegetation Management (Agricultural) mileage cost	60	$0.575	$35	4,472.0	$154,284

Proposed Mileage Hotel and Per Diem Cost for Commercial Ag (Veg Mgmt)

	Hotel Rate/Night	No. of Nights	No. of Days	Travel Cost Per Applicator	Number of Applicators	Regional Cost
Veg. Management (Agricultural) hotel cost	$120	1		$120	894.4	$107,328
Veg. Management (Agricultural) per diem cost	$46		2.0	$92	894.4	$82,285
Total						$189,613
						$4,815,897

Net Present Value of State Costs

Baseline	$0
Proposed	$32,821,493
NPV Difference	$32,821,493
Discount Rate	3.00%
Annualized Rate	0.113816012
Annualized RIC	$3,735,611

Agricultural Applicators - Aerial

Another area of concern is the cost of lost time and travel costs associated with agricultural applicators – aerial having to participate in additional trainings. The additional certification requirements will cause agricultural applicators – aerial to be away from their business an additional 4 days each year. Table 21 outlines the data and assumptions used to estimate the additional cost of the proposed increase in certification requirements.

Table 21. Estimate of lost business revenue for agricultural applicators - aerial

No. of agricultural applicators - aerial			571
No. of business days lost			4.0
Average business revenue/day			$9,600
Number of applicators traveling to trainings			571
Average round trip miles traveled			60
IRS Mileage rate*			$0.575
*assume same mileage rate for years 3-10			
Percent that lodge overnight in hotel			20.0%
Hotel rate (including occupancy and sales tax)			$120
For overnight stays, number of days traveling			4.0
Per diem cost (per day) for overnight travelers			$46

We used average revenue per day of $9,600 for agricultural applicators - aerial. While we are not aware of any published data on gross revenue for aerial applicators, we consider this to be a very conservative estimate based on our knowledge of the industry. Using the data and assumptions above, business revenue lost is estimated at $21.9 million per year; mileage cost (travel) is estimated at $19,700 per year, hotel lodging is estimated at $41,112 per year, and per diem cost is estimated at $21,013 per year; for a total cost of $22.0 million (Table 22). Considering there is a 2-year implementation period, these costs would occur in years 3 through 10. The net present value of these costs over 10 years (8 of the 10 years) is $149.9 million while the annualized cost is $17.0 million (Tables 10 and 22).

Rather than estimating the baseline costs as EPA did in their analyses, we looked at only the additional cost of the proposal since it is additive to the baseline. It is not necessary to have a baseline costs in this particular situation.

Table 22. Calculations for Lost Business Revenue for Agricultural Applicators - Aerial

Proposed Revenue Lost for Commercial Applicator Agricultural (Aerial)

	Revenue Per Day	Days Lost/Yr	Revenue	Number of Applicators	Regional Cost
Aerial (Agricultural) revenue (single day)	$9,600	4.0	$38,400	456.8	$17,541,120
Aerial (Agricultural) revenue (overnight stay)	$9,600	4.0	$38,400	114.2	$4,385,280
Total				571.0	$21,926,400

Proposed Mileage Cost (Travel Cost) for Commercial Applicator Agricultural (Aerial)

	Average Miles Traveled Round Trip	IRS Mileage Rate	Travel Cost Per Applicator	Number of Applicators	Regional Cost
Aerial (Agricultural) mileage cost	60	$0.575	$35	571.0	$19,700

Proposed Mileage Hotel and Per Diem Cost for Commercial Applicator Agricultural (Aerial)

	Hotel Rate/Night	No. of Nights	No. of Days	Travel Cost Per Applicator	Number of Applicators	Regional Cost
Aerial (Agricultural) hotel cost	$120	3		$360	114.2	$41,112
Aerial (Agricultural) per diem cost	$46		4.0	$184	114.2	$21,013
Total						$62,125
						$22,008,224

Net Present Value of State Costs

Baseline	$0
Proposed	$149,991,331
NPV Difference	$149,991,331
Discount Rate	3.00%
Annualized Rate	0.113816012
Annualized RIC	$17,071,415

Cost to the State of Texas

In the EPA's estimate of costs to states, jurisdictions, and federal agencies, the cost to Texas is estimated at $8,810 annually. This cost is comprised of revising state plans, submitting revised state plans, developing teaching materials, and EPA's costs for reviewing exams. It doesn't include the cost associated with the additional time required by Extension agricultural agents and specialists to conduct the additional certification trainings associated with the EPA proposed changes, nor does it include travel costs for agents and specialists to conduct additional trainings. While this additional time (2 days per year) may not translate to higher salary or wage cost for the state, the additional time spent on certification trainings does take agents' and specialists' time away from other educational programs that address important issues facing Extension clientele and the state. As such, the value of their time is the opportunity cost associated with the increased demand on their time. To value this proposed increased demand on their time, the mean salary of agents and specialists (Associate Professor and Extension Specialist title) in Texas was used (converted to an hourly basis). The cost of increased travel was also included. Data and assumptions used in this economic cost estimate are described in Table 23. We estimate the annualized economic cost of agents' and specialists' time at $124,861. This cost is in addition to EPA's cost of $8,810.

Table 23. Estimate of cost to the State of Texas	
No. of Extension Agricultural Agents effected	252
Mean Salary: Extension Agricultural Agents	$55,097
Salary per hour	$30.61
Average Wage value/day	$244.88
No. of additional days of training/agent/year	2.0
No. of additonal hours/year/agent required (8)	16
No. of Extension Specialists effected	30
Mean Salary: Extension Agricultural Specialists	$92,000
Salary per hour	$51.11
Average Wage value/day	$408.89
No. of additional days of training/specialist/year	2.0
No. of additonal hours/year/specialist required (8)	16
Agents: No. round trip miles traveled per training	15
Specialists: No. round trip miles traveled per training	300
IRS Mileage rate*	$0.575
*assume same mileage rate for years 3-10	
Specialists: Percent that lodge overnight in hotel	50.0%
Hotel rate (including occupancy and sales tax)	$120
For overnight stays, number of days traveling	3.0
Per diem cost (per day) for overnight travelers	$46

Using the data and assumptions above, the economic cost of agents' and specialists' time is estimated at $147,951 per year; mileage cost (travel) is estimated at $7,349 per year, hotel lodging is estimated at $3,600 per year, and per diem cost is estimated at $2,070 per year; for a total cost of $160,969 (Table 24). Considering there is a 2-year implementation period, these costs would occur in years 3 through 10. The net present value of these costs over 10 years (8 of the 10 years) is $1.09 million while the annualized cost is $124,861.

Rather than estimating the baseline costs as EPA did in their analyses, we looked at only the additional cost of the proposal since it is additive to the baseline. It is not necessary to have a baseline costs in this particular situation.

Table 24. Calculations for Costs to the State of Texas

Proposed Value of County Agents and Specialists Lost Time

	Value of Time per Day	Days Lost/Yr	Total Value of Time	Number of Agents/Specialists	Regional Cost
County Agent Lost Time	$245	2.0	$490	252.0	$123,417
Specialist Lost Time	$409	2.0	$818	30.0	$24,533
Total				282.0	$147,951

Proposed Mileage Cost (Travel Cost) for County Agents and Specialists

	Average Miles Traveled Round Trip	IRS Mileage Rate	Travel Cost Per Agent/Specialist	Number of Agents/Specialists	Regional Cost
County Agent mileage cost	15	$0.575	$9	252.0	$2,174
Specialist mileage cost	300	$0.575	$173	30.0	$5,175
Total					$7,349

Proposed Mileage Hotel and Per Diem Cost for Specialists

	Hotel Rate/Night	No. of Nights	No. of Days	Travel Cost Per Specialist	Number of Agents/Specialists	Regional Cost
Specialist hotel cost	$120	2.0		$240	15.0	$3,600
Specialist per diem cost	$46		3.0	$138	15.0	$2,070
Total						$5,670
						$160,969

Net Present Value of State Costs

Baseline	$0
Proposed	$1,097,043
NPV Difference	$1,097,043
Discount Rate	3.00%
Annualized Rate	0.113816012
Annualized RIC	$124,861

Summary and Conclusion

The purpose of this paper is to assess the EPA's report, focusing on the economic cost estimates for Texas. We replicated all of EPA's cost calculations, and find their methodology appropriate for this type of analysis. For private and commercial applicators, the majority of EPA's estimated costs are tied to the proposed minimum age requirement. However, after studying the EPA report, we have identified several economic costs that were not taken into account. For private applicators, these costs include the economic cost of their time and associated travel cost for being away from their business to attend additional certification trainings resulting from the proposed changes in regulations. For commercial applicators, these costs also include the economic cost of their time (lost business revenue) and associated travel cost resulting from being away from their business. For the state, the costs include the economic costs of Texas A&M AgriLife Extension Service agricultural agents' and specialists' time and increased travel costs resulting from conducting more certification trainings to meet the needs of the proposed changes in regulations.

EPA's total annualized regional costs for Texas is $954,810, which includes $106,000 for private applicators, $840,000 for commercial applicators, and $8,810 for state and federal agencies. We have estimated the annualized economic costs for private applicators at $28.5 million, $29.3 million for commercial applicators, $124,861 for costs to the state, for a total cost of $58.0 million. These costs are in addition to the costs estimated by EPA.

Appendix

The purpose of the appendix is simply to document various pieces of information found in the EPA's report that is relevant to Texas.

The following table contains the Texas mean wage rates from the Bureau of Labor Statistics, and the U.S. wage rates (2013) used by EPA in their report.

BLS Occupation Category	Texas(1)	U.S.(1)
Landscaping Services	$11.16	$12.65
Pesticide Sprayers and Handlers	$15.86	$14.82
Farmers and Ranchers	$33.88	$35.83
Management Occupations (Sr. Technician)	$53.21	$39.78
Life, Physical, & Social Science Occupations (Jr. Technician)	$35.28	$27.20
Office and Administrative Support Occupations (Clerical)	$16.12	$18.76

(1) These wage rates do not include the 45% factor for the cost of benefits used throughout the EPA report.

Comments

A. Private Applicators – EPA Cost Estimates and Methodology

a. Category Certification for Private Applicators

i. Under the Texas Private Applicator Category Certification for Aerial Category – on page 11 of 55 in Appendix B, EPA has estimated net present value of $3,000 for first-time applicators, whereas, I come up with $2,194 for first-time applicators, but I come up with the same regional cost (RC) for first-time applicators of $249 used to calculate the present value and followed the same methodology and equation EPA has in Appendix A for calculating the present value.

ii. Under the Texas Private Applicator Category Certification for Non-Soil Fumigation Category – on page 11 of 55 in Appendix B, EPA has estimated net present value of $24,000 for first-time applicators, whereas I come up with $22,301 for first-time applicators, but I come up with the same regional cost (RC) for first-time applicators of $2,536 as EPA and followed the same methodology and equation used by EPA for calculating the present value.

iii. With a and b happening and being different between my estimates and EPA's, this resulted in my estimated present value for both first-time and existing applicators for aerial and non-soil fumigation categories to be $54,059, whereas EPA had an estimated present value of $57,000 with annualized incremental RC of $6,000.

b. Texas Non-Certified Private Applicators under the Supervision of a Certified Private Applicator
    i. There is a discrepancy in the reporting of the estimated baseline regional costs for UTS and Private applicator between Appendix A and Appendix B, which ultimately shows different estimated present value for baseline, and the NPV difference between proposed and baseline present value and annualized regional incremental costs. Appendix A (page 270 or 668) shows the baseline regional costs to be $120,164 (UTS and Private), which is the same as the proposed regional costs, thus, resulting in the same present value ($1,054,212) for both baseline and proposed and zero for the difference in present value of baseline and proposed and annualized regional incremental costs. Appendix B (page 13 and 14 (Table B.1.c-1) of 55) shows the present value of baseline costs was $1,047,000 and present value of proposed costs as $1,054,212, thus resulting in a difference of present value of $7,000 and an annualized regional incremental costs of $822 (rounded to $1,000). **Key note, the Final Proposed Report uses Appendix B estimated present values.**

c. Recertification for Private Applicators
    i. EPA's calculation of Regional Costs (RC) for adolescents and adults is not making since in Table B.1.e-4, B.1.e-5, B.1.e-6, and B.1.e-7 (Recertification in Year 3 through 6). Within each of the tables, EPA is showing a cost of $104 per adult applicator ($51.96 wage, 6 hours of training time, and frequency of 0.333), which will be multiplied by the number of adult private applicators that are recertified; however, to arrive at their estimated Regional Costs for Proposed Requirements for both adult and adolescent applicators, we would have to use the higher cost per applicator of $155.88 ($51.96 wage, 15 hours of training time, and frequency of 0.200). So, there is some discrepancy between the numbers in the table.

B. Commercial Applicators – EPA Cost Estimates and Methodology

C. Government Entities – EPA Cost Estimates and Methodology

a. EPA Costs of Administering the Exams/Trainings - In Table B.3.b-1 in Appendix B entitled "Present Values, Proposal & Baseline Costs, Incremental Costs & Annualized Incremental Costs for Administering Exams/Trainings), EPA has estimated present value for baseline of $83,000, present value for proposed of $114,000, net present value of the difference of $31,000 and an annualized incremental costs of $3,600. The methodology of calculating these costs was not found (Steps 1 and 2 in Appendix A referenced in Appendix B) and unclear how EPA calculated these present value and costs. Thus, unable to replicate these costs in spreadsheet.

Number of Actors as Reported by EPA for Texas

Table 3.3-1 Number of Commercial Applicators by Jurisdiction

Jurisdiction	First-Time Applicators	Existing Applicators	Average Categories/Applicator
Texas	1,716	17,478	2.0

Table 3.3-2 Estimated Number of Commercial Applicators under 18 years of Age

Jurisdiction	16 year old First-Time Applicators	16 year old First-Time Applicators	17 year old Existing Applicators
Texas	3.4	3.1	5.1

Table 3.3-3 Expected Number of Commercial Applicators in Aerial & Chemigation Categories

Jurisdiction	First-Time Applicators, Aerial	Existing Applicators, Aerial	First-Time Applicators, Chemigation	Existing Applicators, Chemigation
Texas	64	533	2	28

Table 3.3-4 Expected Number of Commercial Applicators in Soil & Non-Soil Fumigation Categories

Jurisdiction	First-Time Applicators, Soil Fumigation	Existing Applicators, Soil Fumigation	First-Time Applicators, Non-Soil Fumigation	Existing Applicators, Non-Soil Fumigation
Texas	19	175	84	1,045

Table 3.3-5 Estimated Number of Non-Certified (NC) Applicators Applying RUPs under the Supervision of Certified Commercial Applicators, by Jurisdiction

Jurisdiction	Noncertified Applicators UTS of Commercial Applicators	16-17 Year Old Noncertified Applicators
Texas	55,148	717

Table 3.3-6 Number of Private Applicators, by Jurisdiction

Jurisdiction	First-Time Applicators	Existing Applicators
Texas	3,031	40,170

Table 3.3-7 Estimated Number of Private Applicators under 18 years of Age

	First-Time Applicators, Family		Existing Applicators, Family		First-Time Applicators, Hired
Jurisdiction	< 16 year old	16-17 year old	< 16 year old	16-17 year old	16-17 year old
Texas	6.3	3.2	3.2	10.6	0.7

Table 3.3-8 Expected Number of Private Applicators in Aerial & Chemigation Categories

Jurisdiction	First-Time Applicators, Aerial	Existing Applicators, Aerial	First-Time Applicators, Chemigation	Existing Applicators, Chemigation
Texas	1	5	12	174

Table 3.3-9 Expected Number of Private Applicators in Soil & Non-Soil Fumigation

Jurisdiction	First-Time Applicators, Soil Fumigation	Existing Applicators, Soil Fumigation	First-Time Applicators, Non-Soil Fumigation	Existing Applicators, Non-Soil Fumigation
Texas	149	1,355	7	93

Table 3.3-10 Estimated Number of Non-Certified Applicators Applying RUPs under the Supervision of Certified Private Applicators, by Jurisdiction

Jurisdiction	Non-certified Applicators UTS of Private Applicators	Non-Certified Applicators, Family		Non-Certified Applicators, Hired	
		< 16 year old	16-17 year old	< 16 year old	16-17 year old
Texas	3,846	42.0	58.9	15.4	73.1