More EI with Less Time and Money Invested

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ABSTRACT

Idaho DEQ (IDEQ) is using technology to overcome budgetary and personnel shortfalls in emissions inventory projects. High-tech tools and inter-agency cooperation allow IDEQ to complete required work with fewer people and in less time. IDEQ created an in-house software program to gather point source data for annual and periodic emissions inventories, ran Vehicle Identification Number (VIN) decoding software to improve fleet-mix over MOBILE6.2 defaults, and is currently working with the Idaho Transportation Department (ITD) to improve heavy-duty vehicle fleet-mix and vehicle miles traveled (VMT) estimates. The in-house software allows facilities to log into an IDEQ Web server using a unique username and password provided by the agency. The program's layout follows the 44 data elements in the Consolidated Emission Reporting Rule (CERR); therefore, providing the exact data that the Environmental Protection Agency (EPA) is wanting in the National Emissions Inventory (NEI). The program also limits the amount of quality assurance (QA) needed on the data by "controlling" user entry in each submission field. Once the data is submitted by the facility, it is automatically placed into a SQL server database. From there, the data tables can easily be exported into Access, in the NIF eight-table format, in order to run the EPA QC tools. The mixture of these elements allows IDEQ to complete and submit a periodic emissions inventory in the amount of time proposed in 2011, less than 12 months; all while using only two full-time and three part time employees.

INTRODUCTION

In-house emissions inventory software was created to reduce personnel time for both IDEQ and industry, solve point source data collection problems experienced in past inventory projects, and speed submittal and QA times. Several spreadsheets and automated data collection programs had been tried, but failed to provide a universal platform for point sources to enter their actual emissions like the Web. Problems also arose with budget at the agency just after 9-11 sank our state economy. We had too few people and too little money to complete inventories unless new methods were found. Facility personnel were complaining about the inventory requirements and IDEQ's inability to gather the data in an easy, reliable manner. Industry also pointed out the need to improve inventory accuracy in the mobile and area sources to show the problems weren't all point source related. IDEQ was also concerned about improving the methods used in generating the inventories and getting more accuracy in the emissions estimations. Wherever possible, IDEQ leaned on other agencies for better data to use in calculations and on the use of computer programs and roadway counters to gather better fleet-mix and VMT data.

BODY

Web-based Point Source Survey Tool

IDEQ developed an on-line point source emissions survey program for use in the calendar-year 2002 periodic inventory. The program was updated using industry input and used again in the 2003 and 2004 annual inventories before being updated to include a feature for Title V registration of pollutants for fee purposes. So for 2005, the IDEQ software handles two similar industry information requests in one step -- emissions inventory and pollutant registration.

The software matches the exact data requirements of the CERR; therefore, providing the most complete inventory possible for the NEI. Facilities in Idaho were once reluctant to provide IDEQ with information on their throughput, emissions, and possible trade secrets, but all are now familiar with the CERR, the fact IDEQ must provide this data to EPA, and the ease of use of the on-line data submittal software. IDEQ can see that facilities comply much faster to comply with our information request for emissions and registration data. For the calendar 2005 periodic inventory, industry had 90 days to submit their emissions. This three-month periods leaves IDEQ six weeks to prepare and send facilities invoices for their Title V fees and eight weeks to complete additional QA on submitted inventory data -- the portion of the QA that was not already provided by the survey software -- before submittal to EPA is accomplished.

The point source survey software program is written in HTML, runs in ColdFusion, and uses some Java script to create an emission inventory menu tree on the main page with subfolders for Facility Information, Stack Data, and Point Data. The program is directly tied to a SQL server database for storage and automatically places the data into the NIF eight-table format. IDEQ made the software available to other agencies free of charge under a general public license.

Following electronic submission of facility emissions data for calendar year 2005, IDEQ simply prints a PDF of each submittal and begins QA of each calculation, verifies control references reported, checks each emissions factor, and will then run the EPA QC tools on the data before submittal to EPA. The in-house software reduces the QA needed by instantly sending an error message to the end user when data does not match the correct format, size, range, or data type for that specific field. The QA in the program has reduced the number of inventory QA personnel checking the point source data from five used to QA submitted electronic and paper spreadsheets in the 1999 periodic inventory, to 1 person working just 100 hours on the 2005 project.

Through use of this Web-based program, the SQL server database, and the built-in QA features, IDEQ will have the point source portion of the 2005 periodic emissions inventory, Title V registration of pollutants with mailed invoices for fees, all necessary QA, and the point data shipment to EPA completed before the six month deadline proposed for 2011 (June 1 the year after).

Other Proposed Advances in Inventory Development

The software program certainly is the largest time and money saving tool implemented by IDEQ to date for our inventories. Currently, discussions are underway to develop a similar software tool that will allow IDEQ to gather area source (non-point) industrial and commercial data from those smaller emitters. Again, this will be through a Web interface. If authority is there, this new program will allow IDEQ to improve the accuracy of the area source portion of inventories, track PSD increment, and provide data for possible regional haze control strategies should Best Available Retrofit Technology (BART) fail to meet our glide path for improved visibilities in Class I areas on the Colorado Plateau.

More Hi-tech Help

IDEQ was able to use a transportation-based grant to look into better fleet-mix and VMT data for use in or with our MOBILE6.2 runs. It is estimated our mobile source calculations may be off by as much as 200% because of continued use of MOBILE default fleet-mix and Federal highway data to estimate VMT. IDEQ needed better methods for gathering fleet-mix and estimating VMT across the state. Idaho has a large number of light-duty trucks in the fleet; just how many was unknown because statewide emissions or safety testing of vehicles is absent. Therefore, there were no state databases filled with odometer readings. IDEQ asked ITD to provide registration data for all vehicles in Idaho. We used the grant money to have all of the VINs decoded using a software program that determines vehicle make, model, weight, original engine type, MOBILE6.2 category, etc. This data will be used as the

fleet-mix rather than using the default. On early review of the VIN decodes, it is obvious that Idaho has more light-duty trucks and an older, dirtier fleet than the default provided. That will improve our accuracy.

The heavy-duty portion of our fleet-mix is not registered in-state. To combat this problem, IDEQ has partnered with ITD to get weigh-in-motion data that provides axle spacing information and weight of these vehicles on all roadways into and out of the state. ITD is busy querying this information from their databases and applying the MOBILE6.2 classifications to there findings. This data will then be sent to IDEQ for use in the summer 2006 MOBILE runs done for the 2005 periodic inventory. This will further improve our accuracy.

The same grant allowed us to hire a contractor to search available data and determine a better method for gathering VMT across Idaho. Outside of the populated areas in the state there is really nothing but wilderness, so good traffic counts in most areas were thought to be missing. The contractor found shortcomings in the federal highways data IDEQ had been using. We discussed options with ITD for use of counters across the state to get surrogates to apply to all road types in regions of different population densities. ITD was in favor of providing this type data and was even willing to place counters for IDEQ in areas where transportation-related emissions were creating risk of PM2.5 nonattainment. The counter data is being queried from the ITD databases for use in VMT estimates for the 2005 inventory. This should improve the accuracy even more.

IDEQ is also a year into development of a new agency-wide database that will allow our point source inventory and pollutant registration tool to have a permanent home. It will also provide on-line air permit applications, and store air permit information and inspection and enforcement data, as well as water quality and other agency data. The system is being designed where a single query for a facility will provide all information, from all divisions within the agency, for that point in a transparent manner (public will be able to query the data too). The first portions of the database will belong to the Air Quality Division and should be up and running within the next six to eight months.

Schedule Juggling for the 2005 Periodic Inventory

Like other states, Idaho has budget problems and this requires some juggling of money or timing portions of projects so they fall into different fiscal years. The 2005 periodic emissions inventory is no exception. The fiscal year begins July 1 each year in Idaho, with the majority of IDEQ's budget being in the form of federal money. The state-provided portion of our funds, or base money, is full in the summer months and begins to dwindle by March. This "base" money is used for all portions of the emissions inventory projects but the point source data gathering and QA. Therefore, it is imperative to get the area, mobile, non-road and biogenic sources completed when base money is available.

The 2005 emissions inventory was scheduled so as to take full advantage of this budgetary scenario. The point source data gathering via the on-line survey tool and the QA of the submittals is done during January through May using federal money (Title V fees and EPA provided funds) when base money is scarce. When the month of June arrives, the point source data will be complete and already shipped to EPA. At this time, the new Idaho fiscal year starts and we have the full compliment of base funds available for the area, mobile, non-road, and biogenic source calculations.

Splitting the schedule like this allows for ample funding of two full-time inventory positions -- Monitoring & Emissions Inventory Coordinator and the Air Quality Data Analyst (both do air monitoring work on top of emissions inventories); and the three part-time positions needed -- contracted work from IDEQ's Technical Services Division, which includes two engineers that complete the mobile, area, non-road, and biogenic calculations; plus, another that completes all of the QA work for all sources. Once this second, base-funded, portion of the inventory project is completed, the data will be

shipped to EPA before the December 31 deadline projected for 2011's inventory. A similar schedule was used for the 2002 inventory, but the six-month periods were reversed and the budget got lean. The 2002 project took just over 12 months to complete.

To add a little perspective, the 1999 inventory project required 14 persons using approximately 2200 combined work hours, cost nearly $75,000, was incomplete per the CERR, and took every minute of the 17-months provided in the CERR. The 2005 inventory will require only five people, is budgeted for about 1,200 hours, will be completed in under 12 months, with a savings of nearly $25,000 over 1999's project. The largest portion of the time and personnel savings is from the point source survey tool automatically formatting the data upon submittal and completing so much of the QA as the data is entered into the system.

CONCLUSION

The Web-based point source survey tool greatly reduces work time and expense in an emissions inventory project by speeding point data submittals; providing a consistent data format ready for correction, QC tool runs, or EPA submittal; and delivering QA on most data entry fields. Other hi-tech projects on the IDEQ horizon may speed up the inventory process a little bit more by providing easier access to good data, but most will simply improve the accuracy of those source calculations. Available services and software from contractors or other agencies within Idaho will also enhance speed and accuracy in the mobile source category. All in all, there are methods available at a pretty low price, or through constructive planning, which allow for an accurate and speedy emissions inventory; an inventory that meets all of EPA's requirements in the CERR. Now, if only we could add the authority to the CERR that would allow us to ask industry for HAPs data…

REFERENCES

None

KEYWORD

Emission Inventories
Program
Web-based
National Emissions Inventory
NEI
Consolidated Emissions Reporting Rule
CERR
Point Source
VIN