Internal Audit Report

Vegetation Management: Non-Contracted Herbicide Operations

TxDOT Office of Internal Audit
Objective
Evaluate the effectiveness of methods used for vegetation management as it relates to non-contracted herbicide operations.

Opinion
Based on the audit scope areas reviewed, control mechanisms are effective and substantially address risk factors and exposures considered significant relative to impacting operational execution and compliance. The organization's system of internal controls provides reasonable assurance that key goals and objectives will be achieved despite control gap corrections and improvement opportunities identified. Control gap corrections and improvement opportunities identified have the potential to negatively impact the achievement of the organization's business/control objectives.

Management concurs with the above finding and prepared a management action plan to address deficiencies.

Control Environment
Overall, the Maintenance Division (MNT) and the sampled districts have a positive tone regarding the herbicide program and the control of the herbicide inventory. Employees interviewed at MNT and the districts exhibited a desire to perform their responsibilities to ensure the success of TxDOT’s herbicide program. In addition, the MNT-Vegetation Management Section (MNT-VMS) and district maintenance management rely on the herbicide applicators to work in accordance with the Herbicide Operations Manual and the herbicide training.

Summary Results

<table>
<thead>
<tr>
<th>Finding</th>
<th>Scope Area</th>
<th>Evidence</th>
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<tbody>
<tr>
<td>1</td>
<td>Statewide Herbicide Program</td>
<td>Sections in two of three districts reviewed were missing data required for MMS.</td>
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<td>• 1 of 8 (13%) sections reviewed omitted the majority of required acreage data from MMS, thus, reducing the ability to analyze the full performance of the section and the district</td>
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<td>• 1 of 8 (13%) sections reviewed omitted material usage data from the Daily Activity Reports and later entered the material charges to incorrect roadways</td>
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Audit Scope
The audit was performed by Tracy Beyer, Albert Bourque and Sabra Vaughan (Engagement Lead). The audit was conducted during the period from January 13, 2014 to March 7, 2014.

This audit focused on evaluating the effectiveness of oversight of the statewide herbicide program by the Maintenance Division (MNT) and evaluating the monitoring of the non-contracted herbicide program at the district and section levels. Audit testing was performed at the Amarillo, Dallas and Pharr districts.

Methodology
The methodology included obtaining information on herbicide spending by district and identifying and selecting districts for review.

Information collected and reviewed included:
- Policies and procedures
- The Herbicide Operations Manual
- Data extracts from Maintenance Management System (MMS)

These procedures were applied as necessary to perform the audit fieldwork:
- Interviews of key employees from MNT and the selected districts
- Site visits of selected district maintenance sections to:
  - review and evaluate supporting documentation for the herbicide program
  - verify herbicide data entered into the MMS used to report herbicide work performed and costs of the herbicide work to MNT management

To determine the effectiveness of the current monitoring in place, audit testing was performed at a total of 8 maintenance sections in 3 districts: Amarillo District – 2 maintenance sections; Dallas District – 3 maintenance sections; and the Pharr District – 3 maintenance sections. Testing included:
- verifying correct chemicals were applied for the specific targeted vegetative species
- verifying the correct chemical rate was used for the specific targeted species
- verifying chemical mixing and application calculations were correctly performed
- verifying correct recording of the herbicide work performed into MMS
- verifying adequate control of the herbicide chemicals

Background
This report is prepared for the Texas Transportation Commission, TxDOT Administration, and Management. The report presents the results of the Vegetation Management: Non-Contracted Herbicide Operations Audit which was conducted as part of the Fiscal Year 2014 Audit Plan.

TxDOT uses chemical vegetation control (herbicides) to reduce the need for mowing the roadsides yet control the vegetation so that the roadsides are safe for the travelling public and aesthetically pleasing. MNT is the office of primary responsibility for the department’s
Vegetation Mgmt: Non-Contracted Herbicide Ops.  

July 25, 2014  4

herbicide program. Employees of MNT’s Vegetation Management Section (MNT-VMS) perform the following:

- test herbicides
- determine which herbicides should be stocked
- annually update the Herbicide Operations Manual with the testing results and recommended herbicide applications in order to obtain desirable results
- conduct annual training and testing of department personnel
- report the training and testing information to the Texas Department of Agriculture, who issues licenses to the department’s applicators
- perform annual equipment inspections and calibrations at the time of the training in each district
- review district herbicide performance and MMS reports for district herbicide program effectiveness
- serve as a resource for districts to contact for advice for special vegetation problems

We conducted this performance audit in accordance with Generally Accepted Government Auditing Standards and in conformance with the International Standards for the Professional Practice of Internal Auditing. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. Recommendations to mitigate risks identified were provided to management during the engagement to assist in the formulation of the management action plans included in this report. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives. The Office of Internal Audit transitioned to Committee of Sponsoring Organizations of the Treadway Commission (COSO) Internal Control – Integrated Framework version 2013 in December 2013.

A defined set of control objectives was utilized to focus on operational and compliance goals for the identified scope areas. Our audit opinion is an assessment of the health of the overall control environment based on (1) the effectiveness of the enterprise risk management activities throughout the audit period and (2) the degree to which the defined control objectives were being met. Our audit opinion is not a guarantee against operational sub-optimization or non-compliance, particularly in areas not included in the scope of this audit.
Detailed Finding and Management Action Plan (MAP)

Finding No. 1: Monitoring and Documentation of the Statewide Herbicide Program

Condition
The Maintenance Division–Vegetation Management Section (MNT-VMS) does not have a documented program to monitor and follow-up on the districts’ execution of their herbicide program at the maintenance office, district, or statewide levels. Additionally, specific monitoring activities to ensure the effectiveness of the districts’ execution of the herbicide training, such as an independent review of the documentation, are not required at the maintenance office or district levels.

Effect/Potential Impact
The potential impacts of not having proper monitoring or documentation of the department’s herbicide program are as follows:

- Ineffective herbicide control
- Rework
- Unsafe roadsides for the traveling public
- Poor roadside aesthetics
- Material shrinkage
- Inaccurate reporting and data in the Maintenance Management System (MMS)

Criteria
*The Herbicide Operations Manual* created by the Maintenance Division (MNT) is a detailed instruction guide for the mixing and application of herbicides used by the herbicide applicators throughout the state. Additionally, MNT-VMS provides annual training to all TxDOT herbicide applicators and administers testing to meet Texas Department of Agriculture’s licensing requirements.

Cause
MNT provides the annual herbicide training to communicate regulations, policies, and procedures for the Statewide Herbicide Program. In addition to the training, MNT expects that the guidelines in the *Herbicide Operations Manual* will provide enough guidance to operators to ensure effective and efficient application of the chemicals. Specific monitoring activities at the district level, such as an independent review of the herbicide records and corresponding Daily Activity Report (DAR), are not required.

Evidence
Testing of 8 maintenance sections at 3 districts identified exceptions that could have been detected and corrected by a supervisory review or monitoring process as follows:

- Sections in the Dallas and Amarillo districts were missing data required for MMS:
  - 1 of 8 (13%) sections reviewed omitted the majority of required acreage data from MMS, reducing the ability to analyze the full performance of the section and the district
  - 1 of 8 (13%) sections reviewed omitted material usage data from the DARs and later entered the material charges to incorrect roadways
Management Action Plan (MAP):

MAP Owner: Dennis Markwardt, Vegetation Management Section Director

MAP 1.1: In order to achieve more formalized and documented visits with the districts, the Maintenance Division–Vegetation Management Section (MNT-VMS) will, upon completion of each district’s training, send the district a summary report of the visit. This summary will list the following:

1. Number of employees trained
2. Number of employees tested
3. Number of employees who passed the exam
4. Number of trucks inspected
5. The condition and scoring of the trucks
6. Record book discrepancies

This summary will be for the districts’ records and distribution to appropriate personnel. MNT-VMS will also keep a record of each summary.

MNT-VMS will issue a memorandum to the districts stating that an independent review of the herbicide records, corresponding DARs and MMS data entry should be performed monthly during the active herbicide season. These independent reviews will be documented by the reviewer initialling and dating each time a review is performed. Updates to the Herbicide Operations Manual will be made at a later publishing date as noted in MAP 1.3.

Completion Date: Action Completed

MAP 1.2: Maintenance Division–Vegetation Management Section (MNT-VMS) will receive TxMAP scoring and evaluation within two weeks of completion for inspection.

MNT-VMS will review all Peer reviews within one month of the completed report.

MNT-VMS will work with MNT-MMS to receive monthly reports on MMS items 540-545.

Documentation of the Maintenance Division’s oversight activities will be noted on the reviewed reports and retained.

Completion Date: September 15, 2014
MAP 1.3:
Maintenance Division–Vegetation Management Section (MNT-VMS) will add verbiage in *Herbicide Operations Manual*, Section 17, Record Keeping, stating that the districts should perform a monthly independent review of herbicide mixing and application records, corresponding Daily Activity Reports, and MMS data entry during the active herbicide season.

MNT-VMS will modify the Herbicide Record Book to include a “Reviewed By” signature line for documentation of the district’s review. MNT-VMS will randomly review Herbicide Record Books during annual training to ensure records are being reviewed. This inspection of the records and whether the records were reviewed will also be added on the summary report of visit.

**Completion Date:**
January 15, 2015
Observation and Recommendation

Audit Observation (a): Inaccurate Unit of Measure in Maintenance Management System (MMS) for Manual Herbicide Applications

Manual herbicide applications (hand-spray, basal) are reported in the MMS with “hours” instead of “acres” as the unit of measure, and no quantity of hours for these manual applications is displayed in MMS reports.

Effect/Potential Impact
In FY 2013, there was $2.5 million of hand-spray and basal herbicide application work performed that was not reported in MMS in a useful manner for management. The Maintenance Division (MNT) cannot adequately monitor the districts’ manual herbicide usage without meaningful data being reported in MMS.

Audit Recommendation
Work with MNT-MMS Maintenance Support Specialist to change the unit of measure for hand-spray and basal herbicide applications to “acres.”
Summary Results Based on Enterprise Risk Management Framework

<table>
<thead>
<tr>
<th>Audit Results Dashboard</th>
<th>Vegetation Management: Non-Contracted Herbicide Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ERM Component</strong></td>
<td><strong>Control Activities</strong></td>
</tr>
<tr>
<td>Control Environment</td>
<td>Organizational Tone</td>
</tr>
<tr>
<td></td>
<td>Planning</td>
</tr>
<tr>
<td></td>
<td>Forecasting</td>
</tr>
<tr>
<td></td>
<td>Goal-Setting</td>
</tr>
<tr>
<td></td>
<td>Cost-Benefit Analysis</td>
</tr>
<tr>
<td>Risk Assessment</td>
<td>Business Continuity</td>
</tr>
<tr>
<td></td>
<td>Evaluations/Analysis</td>
</tr>
<tr>
<td></td>
<td>Management Action Plans</td>
</tr>
<tr>
<td>Control Activities</td>
<td>Policies/Procedure Development &amp; Maintenance</td>
</tr>
<tr>
<td></td>
<td>Approvals/Authorizations</td>
</tr>
<tr>
<td></td>
<td>Supporting Evidence/Records Availability</td>
</tr>
<tr>
<td></td>
<td>Segregation of Duties</td>
</tr>
<tr>
<td></td>
<td>Safeguarding Assets</td>
</tr>
<tr>
<td>Information &amp; Communication</td>
<td>Information Classification</td>
</tr>
<tr>
<td></td>
<td>Information Input</td>
</tr>
<tr>
<td></td>
<td>Information Processing</td>
</tr>
<tr>
<td></td>
<td>Output/Reporting and Messaging</td>
</tr>
<tr>
<td>Monitoring</td>
<td>Exception Reporting Review</td>
</tr>
<tr>
<td></td>
<td>Reconciliations/Root-Cause Analysis</td>
</tr>
<tr>
<td></td>
<td>Peer Reviews</td>
</tr>
<tr>
<td></td>
<td>Management Representations</td>
</tr>
<tr>
<td><strong>Scope Area Assessment</strong></td>
<td></td>
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**Closing Comments**
The results of this audit were discussed with management of the Maintenance Division (MNT) and the sampled districts. We appreciate the assistance and cooperation received from MNT and district employees contacted during this audit.