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Certified Mail
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June 22, 2009

The Honorable Ron Littlefield
Mayor of Chattanooga
1001 Lindsay Street
Chattanooga, TN 37402

Re: **Notice of Violation**
Compliance Evaluation Inspection (CEI) Report
Municipal Separate Storm Sewer System (MS4) – Phase I
NPDES Permit Number TNS068063
Hamilton County, TN

Dear Mr. Littlefield:

On September 22 through September 25, 2008, Ms. Leetha Abazid, Ms. Angela Young, and Mr. Kirk Brode of my staff along with Mr. Ken Kwan of EPA-Region IV performed a Compliance Evaluation Inspection (CEI) of the City of Chattanooga's storm water program. They met with the city's MS4 personnel, Dr. Mounir Minkara (Water Quality Manager), Mr. Bill Payne (City Engineer), Mr. Keith Curtis (Development Engineer), who provided information during the inspection. City staff presented the storm water program progress and accomplishments for the eleventh year of your permit and for Consent Order 05-0171. The purpose of the inspection was to evaluate the storm water program's compliance with the terms and conditions of the NPDES Permit Number TNS068063.

Division staff conducted this CEI by evaluating the elements in your stormwater management program, management of stormwater fee funds, and the elements of your permit.

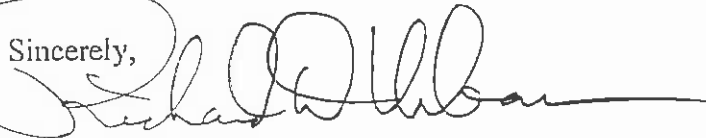
Based on information provided by the city's MS4 program during this CEI, my staff along with EPA determined that the city's MS4 program has failed to meet all conditions of their permit in the following areas: (1) monitoring, (2) industrial inspections, (3) seasonal pollutant loading, (4) dry weather screening (field screening), (5) training, (6) maintenance inspections of City's facilities, and (7) financial.

Attached is the CEI report. Please note that I have forwarded a copy of this report to EPA Region 4 in Atlanta.

It is requested that a **written response** to this NOV be **submitted to this office by July 22, 2009**. The response needs to outline what corrective actions will be taken to correct the attached listed violations.

The Division would like to thank Mr. Payne, Dr. Minkara, Mr. Curtis, and the other city personnel for their time and assistance during our inspection. If you have any questions concerning either our inspection or this report, please contact Ms. Leetha Abazid or Ms. Angela Young at (423) 634-5710 or (423) 634-5708, respectively.

Sincerely,



Richard D. Urban, Ph.D.
Field Office Manager
Division of Water Pollution Control

Attachment

cc: Steve Leach, Director of Public Works, City of Chattanooga, Department of Public Works, 1250 Market Street, Suite 2100, Chattanooga, TN 37402

Bill Payne, PE, City of Chattanooga, Department of Public Works, 1250 Market Street, Suite 2100, Chattanooga, TN 37402

Mounir Minkara, PhD, PE, City of Chattanooga, Department of Public Works, 1250 Market Street, Suite 2100, Chattanooga, TN 37402

Keith Curtis, PE, City of Chattanooga, Department of Public Works, 1250 Market Street, Suite 1000, Chattanooga, TN 37402

Ken Kwan, PE, Environmental Protection Agency, Clean Water Act Enforcement Section, Atlanta Federal Center, 61 Forsyth Street, SW, Atlanta, GA 30303

DWPC, Enforcement and Compliance Section, Nashville Central Office

DWPC, Permit Section, Nashville Central Office

File

TENNESSEE DEPARTMENT OF ENVIRONMENT AND
CONSERVATION
DIVISION OF WATER POLLUTION CONTROL



Compliance Evaluation Inspection (CEI) Report

City of Chattanooga
Municipal Separate Storm Sewer System (MS4) – Phase I
NPDES Permit Number TNS068063
Hamilton County, TN

June 22, 2009

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Compliance Evaluation Inspection (CEI) Report
Municipal Separate Storm Sewer System (MS4) – Phase I
NPDES Permit Number TNS068063
HAMILTON COUNTY, TN

TABLE OF CONTENTS

I.	Introduction	2
II.	Executive Summary	4
III.	Compliance Evaluation of NPDES Permit	10
A.	Part I- Discharges authorized under this permit	10
B.	Part II – Permit Conditions	11
i.	Stormwater Management Program (SWMP) Elements	11
C.	Part III – Schedules for Implementation and Compliance	18
D.	Part IV – Numeric Effluent Limitations (reserved)	19
E.	Part V- Monitoring Requirements	19
i.	Wet-weather Monitoring	19
ii.	Seasonal loading and event mean	19
iii.	Ambient monitoring	19
iv.	Biological sampling	19
F.	Part VI- Reporting Requirements	20
i.	Annual Report	20
G.	Part VII – Standard Permit Conditions	21
i.	Proper Operation and Maintenance	21
ii.	Monitoring and Records	22
IV.	Conclusion	24
	Appendix A: Memorandum of Understandings (MOU)	25
	Appendix B: Notes	50
	Appendix C: Various e-mails	59
	Appendix D: Organizational Chart	75

I.

Introduction

On September 22 through September 25, 2008, Ms. Leetha Abazid, Ms. Angela Young, and Mr. Kirk Brode of the Tennessee Division Water Pollution Control (the division) staff along with Mr. Ken Kwan of EPA-Region IV performed a Compliance Evaluation Inspection (CEI) of the City of Chattanooga's stormwater program. They met with Dr. Mounir Minkara (Water Quality Manager), Mr. Bill Payne (City Engineer), Ms. Rebecca Robinson (Water Quality Coordinator), Mr. Mitch Underwood (Water Quality Specialist), Mr. Jamon Bass (Water Quality Specialist), Mr. Wayne Boyd (Water Quality Technician), Mr. Ray Harrington (Water Quality Technician), Ms. Jessica Steinecke (co-op), Mr. Josh Rogers (co-op), Mr. Keith Curtis (Development Engineer), Mr. Billy Caylor (Soil Engineering Specialist), Mr. Ricky Colston (City-Wide Services), Ms. Charlotte Cunningham (Dispatch), Ms. Debie Mikel (Technical Information Manager), and Ms. Liz Henley (Chattanooga 311 Call Center) of the City of Chattanooga Public Works Department staff who provided information during the inspection. City staff presented the stormwater program progress and accomplishments for the eleventh year of the permit. The purpose of the inspection was to evaluate the stormwater program's compliance with the terms and conditions of the NPDES Permit Number TNS068063.

The City of Chattanooga was required, as part of the Phase I stormwater federal regulations, to develop a stormwater management program improving water quality in receiving streams. The city's stormwater program consists of elements to effectively improve water quality in receiving streams by controlling the quality of stormwater runoff through implementation of control measures and enabling legislation. Mounir Minkara, PhD, PE, manages the city's stormwater quality program.

The city's stormwater program is part of the Public Works Department and is staffed by a manager, a supervisor, and five field inspectors, plus administrative support. Plans review is through a different section of the Public Works Department. There are three field inspectors in the Land Disturbance Division who are funded and were initially part of the Water Quality Division providing inspections of construction sites within the boundaries of the city. These soil engineering specialist/field inspectors report to Mr. Keith Curtis and not Dr. Mounir Minkara. Additionally, a number of work crews performing operation and maintenance duties within the stormwater system are funded as part of the program, though they work out of City Yards. As part of their duties, the stormwater field inspectors (land disturbance division and water quality division) perform approximately 6,200 inspections per year of land disturbance sites as well as enforcement of the city's Landscaping Ordinance, industrial inspections, and complaint investigation. (See Appendix D for a copy of the organizational chart).

Division staff has historically performed annual inspections of the city's MS4 Program. During the years 2004 through 2007, staff identified several reoccurring issues during each of the annual inspections. The improvements observed during this inspection for the construction area of the program, are directly related to issues identified in 2006 and

2007 inspection reports. The majority of the improvements are within the Land Disturbance Division area of the program.

During this Compliance Evaluation Inspection, visits were made to the City Yards, to the Friar Branch Watershed monitoring site on Polymer Drive, to USA Ready Mix on Hudson Road, to the 311 Call Center, to the dry weather screening site on Citico Avenue, to an emergency response on I-75 South near exit 3B, to illicit discharge investigation sites at Wendy's and at King of Kleen Carwash on East Brainerd Road, and to a construction site along Highway 153 at Grubb Road.

II.

Executive Summary

The Division of Water Pollution Control and EPA conducted this CEI by evaluating the elements in the city's stormwater management program, management of stormwater fee funds, the elements of the permit, standard operating procedures, monitoring plans, inspection manuals, and Year 11 Annual Report for 2006-2007.

Based on information provided by the city's MS4 program during this CEI, staff along with EPA determined that the city's MS4 program is deficient in the following areas: (1) monitoring, (2) industrial inspections, (3) seasonal pollutant loading estimation, (4) dry weather screening (field screening), (5) training, (6) maintenance inspections of city's facilities, and (7) financial.

Records and Reports

Part I. D. 2. of NPDES Permit Number TNS068063 requires the City of Chattanooga to submit annual reports, collect monitoring data, and implement a system-wide management program, including public education. Annual reports were submitted as required in Part VI. of the permit. Quarterly progress reports were submitted as required by the order. The reports contained the required information and were received on or before the date due. The reports were signed and certified. The city has maintained records of most activities as required by the permit. The city has kept the division well informed of the major activities by submittal of documents; such as, letters and reports in the form of e-mail or CD. Please be advised that the division requires at least one paper copy of each report submitted.

Training

Parts I.D.1.b. and II.C.9.f. and II.C.8.e. and II.C.8.c. and II.C.7.c. and II.C.6.d. and II.C.5.d of the permit. The implementation of system-wide management program includes adequate training of city personnel to implement the program. During this inspection, inspectors found the training of city inspectors to be inadequate. Specifically, city personnel lack training in calibration of equipment, sampling protocol, chain of custody procedures, data collection, and inspection criteria.

Self-monitoring Program

The city is required to inventory all major outfalls within the geographic area. However, not all major outfalls were identified within MS4 program area. In areas throughout the city boundaries, division staff detected unmapped stormwater outfalls and structures, including major outfalls. Areas with unmapped outfalls/stormwater system include: North Chattanooga area, Emma Wheeler Homes area in South Chattanooga, Alton Park Homes in Chattanooga Creek area, North Chickamauga area, and Lakeshore area.

Monitoring

Part I.D.1.a. and Part I.D.2.a. and Part I.D.2.b. and Part VII.J.4 of the permit. The standard permit condition requires monitoring to be representative and to follow EPA protocol; including test procedures approved under 40 CFR 136. EPA protocol requires proper equipment calibration, sample preservation, adherence to chain of custody procedures, sample collection, valid reagents, and approved test methods for analyses. Inspectors found that the equipment was not properly calibrated, samples were not properly preserved, chain of custody procedures were not being followed, and the city's standard operating procedures for sample collection were not followed.

The city has not fully complied with the monitoring requirements contained in Part V. The ambient monitoring, wet weather watershed sampling, event mean concentrations, seasonal pollutant loadings, biological monitoring and industrial monitoring have not been conducted with parameters as specified in the permit.

The permit identifies the minimum required parameters to be analyzed for monitoring. Table 1 shows what parameters were analyzed by the city for ambient monitoring. Table 2 shows what parameters were actually analyzed by the city for wet-weather monitoring. Table 3 shows the event mean and pollutant loading parameters that were monitored. Table 4 shows the biological parameters that were analyzed by UTC in 1999 and 2001 and reported by the city. Table 5 shows the parameters analyzed by the city for industrial monitoring.

Table 1: The Comparison of the minimum required parameters to be analyzed according to permit and what parameters were actually analyzed by the MS4.

Required Parameters by Permit (Part V.A.2.a)	Analyzed Parameters by MS4	
	Ambient (V.B.1)	
Total Suspended Solids (TSS)	No	
Total Dissolved Solids (TDS)	No	
Oil and Grease	No	
Total Ammonia plus Organic Nitrogen	No	
Nitrate plus Nitrite Nitrogen (as N)	No	
Total Nitrogen	No	
Total Phosphorus	No	
Dissolved Phosphorus	No	
Methylene Chloride	No	
Trichloroethylene	No	
Vinyl Chloride	No	
Bis (2 ethyl-hexyl) phthalate	No	
Fluoranthene	No	
Biochemical Oxygen Demand (BOD5)	No	
Chemical Oxygen Demand (COD)	No	
Fecal Coliform	Yes	
Total Recoverable Chromium	No	
Total Recoverable Copper	No	
Total Recoverable Lead	No	
Total Recoverable Nickel	No	
Total Recoverable Zinc	No	
Total Recoverable Arsenic	No	
Total Recoverable Beryllium	No	
Total Recoverable Cadmium	No	
Total Cyanide	No	

Table 2: The Comparison of the minimum required parameters to be analyzed according to permit and what parameters were actually analyzed by the MS4.

Required Parameters by Permit (Part V.A.2.a)	Analyzed Parameters by MS4	
	Wet-Weather (V.A.2.A)	
Total Suspended Solids (TSS)	No	
Total Dissolved Solids (TDS)	No	
Oil and Grease	No	
Total Ammonia plus Organic Nitrogen	No	
Nitrate plus Nitrite Nitrogen (as N)	No	
Total Nitrogen	No	
Total Phosphorus	No	
Dissolved Phosphorus	No	
Methylene Chloride	No	
Trichloroethylene	No	
Vinyl Chloride	No	
Bis (2 ethyl-hexyl) phthalate	No	
Fluoranthene	No	
Biochemical Oxygen Demand (BOD5)	No	
Chemical Oxygen Demand (COD)	No	
Fecal Coliform	Yes	
Total Recoverable Chromium	No	
Total Recoverable Copper	No	
Total Recoverable Lead	No	
Total Recoverable Nickel	No	
Total Recoverable Zinc	No	
Total Recoverable Arsenic	No	
Total Recoverable Beryllium	No	
Total Recoverable Cadmium	No	
Total Cyanide	No	

Table 3: The Comparison of the minimum required parameters to be analyzed according to permit and what parameters were actually analyzed by the MS4.

Required Parameters by Permit (Part V.A.2(a))	Analyzed Parameters by MS4 Event Mean & Pollutant Loading (V.A.3)
Total Suspended Solids (TSS)	Yes
Total Dissolved Solids (TDS)	Yes
Oil and Grease	Yes
Total Ammonia plus Organic Nitrogen	Yes
Nitrate plus Nitrite Nitrogen (as N)	No
Total Nitrogen	Yes
Total Phosphorus	Yes
Dissolved Phosphorus	Yes
Methylene Chloride	Yes
Trichloroethylene	Yes
Vinyl Chloride	Yes
Bis (2 ethyl-hexyl) phthalate	Yes
Fluoranthene	Yes
Biochemical Oxygen Demand (BOD5)	Yes
Chemical Oxygen Demand (COD)	Yes
Fecal Coliform	Yes
Total Recoverable Chromium	Yes
Total Recoverable Copper	Yes
Total Recoverable Lead	Yes
Total Recoverable Nickel	Yes
Total Recoverable Zinc	Yes
Total Recoverable Arsenic	Yes
Total Recoverable Beryllium	Yes
Total Recoverable Cadmium	Yes
Total Cyanide	Yes

Table 4: The Comparison of the minimum required parameters to be analyzed according to permit and what parameters were actually analyzed by the MS4.

Required Parameters by Permit (Part V.A.2(b))	Analyzed Parameters by MS4 Biological (UTC 1999 & 2001) (Part V.B.2)
Total Suspended Solids (TSS)	Yes
Total Dissolved Solids (TDS)	No
Oil and Grease	Yes
Total Ammonia plus Organic Nitrogen	Yes
Nitrate plus Nitrite Nitrogen (as N)	Yes
Total Nitrogen	No
Total Phosphorus	Yes
Dissolved Phosphorus	No
Methylene Chloride	No
Trichloroethylene	No
Vinyl Chloride	No
Bis (2 ethyl-hexyl) phthalate	No
Fluoranthene	No
Biochemical Oxygen Demand (BOD5)	Yes
Chemical Oxygen Demand (COD)	Yes
Fecal Coliform	No
Total Recoverable Chromium	No
Total Recoverable Copper	Yes
Total Recoverable Lead	Yes
Total Recoverable Nickel	No
Total Recoverable Zinc	Yes
Total Recoverable Arsenic	No
Total Recoverable Beryllium	No
Total Recoverable Cadmium	No
Total Cyanide	No

Table 5: The Comparison of the minimum required parameters to be analyzed according to permit and what parameters were actually analyzed by the MS4.

Required Parameters by Permit (Part II.C.2.a)	Analyzed Parameters by MS4 Industrial (Part II.C.8.e)
Total Suspended Solids (TSS)	Yes
Total Dissolved Solids (TDS)	No
Oil and Grease	Yes
Total Ammonia plus Organic Nitrogen	No
Nitrate plus Nitrite Nitrogen (as N)	No
Total Nitrogen	No
Total Phosphorus	No
Dissolved Phosphorus	No
Methylene Chloride	Yes
Trichloroethylene	No
Vinyl Chloride	Yes
Bis (2 ethyl-hexyl) phthalate	Yes
Fluoranthene	Yes
Biochemical Oxygen Demand (BOD5)	No
Chemical Oxygen Demand (COD)	Yes
Fecal Coliform	No
Total Recoverable Chromium	Yes*
Total Recoverable Copper	Yes*
Total Recoverable Lead	Yes*
Total Recoverable Nickel	Yes*
Total Recoverable Zinc	Yes*
Total Recoverable Arsenic	Yes*
Total Recoverable Beryllium	Yes*
Total Recoverable Cadmium	Yes*
Total Cyanide	No

*These parameters were analyzed, but not all samples collected as required by the permit.

Hydrologic Monitoring

The data required, as part of the hydrologic monitoring was not collected according to EPA approved protocols due to inadequate equipment calibration, failure to follow chain of custody procedures and improper sample collection practices. Therefore, the data collected is not valid.

Fees Management

Part II, Paragraph H of the permit requires that the city provide adequate finances to implement the stormwater program. The city collects a stormwater fee that is based on the land use multiplied by the square feet of the property. The residential fee is a flat rate of \$24-\$36.00/year (property sampling/average). The city has not adjusted user charges since 1993 when the fee originated. A review of the spreadsheet titled City's Fiscal Year 09 Total Requests For Stormwater Fund shows a total decrease of 40% between request and budget funding. The majority of this decrease (\$1,568,533) is associated with salaries and wages. A review of the Water Quality Management Fund (5300) shows a fund and cash balance of approximately \$1.56-million in 2007, and \$1.67-million in 2008. However, the proposed FY09 budget shows a zero amount for fund and cash

balance and no appropriation to the capital project fund. This information suggests that the city may not have adequate finances to implement the program.

Additionally, the city has failed to provide a complete fiscal analysis and itemized sources of funding for each program element in the Year 11 Annual Report as required by Part VI.A.2.g of the permit.

III. Compliance Evaluation of MS4 NPDES Permit

NPDES Permit Number TNS068063 became effective on October 1, 1996 and expired on September 30, 2001. The city reapplied in a timely manner and the permit remains in effect until such time as the new permit is issued. The State of Tennessee Permit Section requested resubmission of application information. The city gave the information to Mr. Jim McAdoo, TDEC permit writer, on September 22, 2008, during the first day of this inspection.

During the CEI, the inspectors identified fifty-seven (57) violations of the permit. The violations were identified in the following Permit Sections: Stormwater Management Program (SWMP) Elements, Annual Report, and Standard Permit Conditions. There were 41 violations of the Stormwater Management Program Elements, 9 violations of annual report requirements, and 7 violations of the Standard Permit Conditions. Each violation is described below in detail:

PART I – DISCHARGES AUTHORIZED UNDER THIS PERMIT

Part I.D. of the permit lists the responsibilities of the city.

1. **Part I.D.2.a.** The city has failed to submit annual report in format as described in Part VI. See pages 20-21 of this report for further details.
2. **Part I.D.2.b.** The city has failed to collect monitoring data as required by Part V. See Tables 1-5. The city is not able to provide documentation that samples are taken according to 40 CFR 122.26, the sampling methodology outlined in permit. The city is unable to document its adherence to its sampling protocol.
3. **Part I.D.2.c.** The city has failed to implement the system-wide management program elements as required. The city has failed to adequately implement all stormwater management program elements, including adherence to city, division, and EPA protocol. See Appendix B for further details.

PART II – PERMIT CONDITIONS

Stormwater Management Program (SWMP) Elements

4. **Part II.C.1.a.i.** The permit requires the city complete the inventory within 36 months of the effective date of the permit, October 1, 1999. The city has failed to locate and correctly identify all structures of stormwater system in the stormwater drainage system inventory. The inventory is incomplete and contains incorrect information. For example, some drainage features (structures/pipes) are listed inaccurately identified in the system. The city included only major outfalls in the system inventory as opposed to the permit requirement to include the appurtenances listed in Part II.C.1.a.i, of the permit. According to page 7 of the city's permit renewal application-part 1; the city identified 744 major stormwater outfalls. In a March 10, 2009 e-mail (see Appendix C), the city advised the division of 89 major outfalls and 294 outfalls recently located within the Chattanooga Creek watershed, an old, highly industrialized area. The city had originally identified 77 outfalls within the Chattanooga Creek watershed. At this point in time, the division expects the city to have identified and included in the inventory all existing outfalls. During the inspection, the division discovered a few areas with unmapped outfalls: These included the North Chattanooga, Emma Wheeler Homes in South Chattanooga, Alton Park Homes in Chattanooga Creek, North Chickamauga, and Lakeshore areas. Division inspectors identified 25+ additional outfalls that are not mapped in GIS.
5. **Part II.C.1.a.iv.** The city has failed to include all data regarding the stormwater system in GIS. The information/data in GIS is not accurate. There have been occasions where information in the GIS was not correct/complete. See Number 3 (Part II.C.1.a.i.) above.

During cleaning/maintenance of the storm drainage system by the Public Works employees, maintenance logs indicated that pipe size checks during the cleaning operation compare to the pipe size entered in GIS Public Works database "As-Found" are not necessarily, in many instances, the same values. Public Works maintenance advised the inspectors that corrections are made for inconsistencies found during cleanings/maintenance of the system.

6. **Part II.C.1.f.iii.** The city has did not adequately measure the effectiveness of the monitoring and evaluation of the program elements, for identified priority watersheds and sub-basins, and baseline ambient water quality. The city did not establish baseline ambient quality because the city did not monitor for all of the permit-required parameters (see Table 1). The division found no evidence of any comparison to or evaluation of data that was obtained. Nor did the division find any evidence of actions taken as a response to data received.

- Roadways
7. **Part II.C.3.a.** The city has failed to address vehicle emissions and discharge of fluids from municipally operated vehicles (fire and police, school bus services and public transit). The city is required to develop a set of recommendations to reduce vehicle emissions and discharge of fluids from municipally operated vehicles. The permit requires that recommendations are to be made and they were not. The city has attempted to address emissions and discharges at City Yards only.
 8. **Part II. C.3.b.** The city has failed to ensure that chemicals at the City Yards are properly stored and covered. The three aboveground tanks have no secondary containment structure. The city was unable to provide documentation of contents and construction of tanks at city yards. City inspectors were unable to identify contents and if the tanks were double-walled tanks. The area where the tanks are located drains to stormwater catch basins/outfalls. The salt storage shed has no berm to ensure rainwater/salt does not migrate to storm drains. Inspectors observed salt and sand outside of containment areas where it could easily migrate to stormwater drains.
 9. **Part II.C.3.e.** The division found no evidence that the city produced a manual of design and maintenance practices for Chattanooga roadway construction and maintenance. During the inspection, the inspectors requested a copy of the manual for evaluation and the city was unable to produce one.
 10. **Part II.C.3.e.** The September 23, 2008 EPA and TDEC joint inspection found that the city failed to ensure that pollution prevention plan practices are implemented at City Yards. This finding is based on the following deficiencies of the SWPPP at the City Yards and the conditions noted during the inspection. The SWPPP was inadequate in:
 - (a) Did not have pollution team responsibilities outlined,
 - (b) Annual training information,
 - (c) No records of meeting stormwater sampling protocol (sample within first 30 minutes of discharge and after 72 hours of dry weather),
 - (d) Housekeeping issues at 2 spots near storm drain near maintenance shop,
 - (e) Three tanks onsite that were unmarked and lack secondary containment,
 - (f) No map (showing flow pattern, outfalls, etc),
 - (g) Map was missing from plan,
 - (h) Routine inspection forms do not look at all potential areas for contaminated stormwater runoff (sand and salt storage areas were not included).

Conditions at site: The inspectors observed oily spots by storm drains near maintenance shop, heavy equipment leakage and salt and sand outside of containment areas, etc.

- Flood Control Projects

11. **Part II. C. 4.** The city failed to evaluate existing flood control facilities for retrofitting. The city stated it has not constructed any flood control structures in the past 5 to 7 years. According to page 13 of the 2006-2007 annual report, the city states, "No major flood control projects were designed or constructed during this permit year. Minor maintenance occurred at some of the existing facilities. The city continues to conduct its annual Brainerd Levee inspection." Since the city has not mapped all structures, ponds, creeks within the MS4 area; therefore, it is not reasonable that the city has evaluated any structures for retrofit. Examples of known areas with potential flooding issues are: Hickory Valley Road & Standifer Gap, golf course off Friar Branch, 23rd Street & Rossville Boulevard, Brainerd Road near Brainerd High School, Igou Gap Road & Jenkins Road, Stormy Hollow Subdivision. In order to comply with the permit, the city must evaluate the need for retrofitting any future flood control projects with water quality control structures.

- Monitoring pollutants in runoff from municipal waste facilities

12. **Part II.C.5.** The city failed to identify all sites where the city is to monitor pollutants from its municipal waste management facilities. The city has not identified any land application sites (biosolids application sites), Summit Landfill, Montigue Park landfill, etc. Records reviewed during this inspection indicate that inspections were performed at City Yards and at 36th Street Landfill only.

13. **Part II.C.5.b.** The city failed to review and inspect pollution prevention programs and provide guidance for compliance with the plans and with the Stormwater Management Department (now known as Stormwater Management Program) SWMD's guidance document. The city failed to address all facilities required by Part II.C.5 of the permit. Records reviewed during this inspection indicate that inspections were performed at City Yards and at 36th Street Landfill only. The city did not inspect or provide guidance to each of the municipal/solid waste facilities in the city. The city is required to review and inspect pollution prevention programs at each municipal/solid waste management facility in the city and to provide guidance for compliance with the plans and with the SWMD's guidance document.

14. **Part II.C.5.d.** The MOUs between SWMD and other city operations defines responsibilities but the MOUs do not address funding obligations for the implementation of water quality requirements. The MOU does not clearly describe the allocation of funding between the Stormwater Management Program and the Combined Sewer Overflow program. The city has also failed to fulfill the responsibilities as outlined in the MOUs. The city's SWMD is not providing: (1) technical assistance regarding drainage and information associated with receiving waters impacted by SSO; (2) training to municipal departments regarding "selective maintenance practices, conduct inspections and monitoring of

restoration project and water quality for CityWide/Parks and Recreation services; (3) maintaining of SWPPPs; (4) provide annual work orders for individuals sites (one per facility) to CSW for charging of time and expenses for permit compliance; (5) provide annual compliance inspection of CWS facilities; (6) conduct annual chemical sampling with a representative of CSW at CSW stormwater outfalls; (7) ensure samples utilize proper chain of custody procedures; (8) conduct quarterly visual sampling during rain events; and (9) provide technical assistance regarding training of CSW employees in the areas of pollution potentials risk analysis and management and other stormwater issues. See the MOUs in Appendix A and notes regarding obligations not fulfilled in Appendix B.

15. **Part II.C.5.d.** There is no defined statement regarding the funding obligations for the implementation of water quality requirements.

- Use Of Pesticides, Herbicides and Fertilizers (PHFs)

16. **Part II.C.6.e.** The city has failed to adequately implement a PHF monitoring program. The city does not utilize adequate sampling protocol (sample collection, chain-of-custody, preservatives, analyzed PHF parameters are for constituents that have been banned) and there have been no areas identified for concentrated efforts/education other than lawn care facilities (no commercial applicator training). It is advised that any PHF monitoring program should include any PHFs that are being currently used, at a minimum. The city has failed to revise the plan every 2 years as stipulated in PHF plan. The city has not provided training to City Wide employees as PHF plan describes every 6 months. The last documented PHF training session was on May 25, 2005.

- Illicit discharges & improper disposal

17. **Part II.C.7.a.** The city has failed to adequately implement an ongoing program to detect and remove illicit discharges and improper disposal into the storm sewer system. From October 2006 to September 2007, the city investigated 97 illicit discharge complaints. Approximately half of these citizen complaints have been addressed with enforcement or penalty. However, there was no information on the status of the others. When evaluating the city's performance in illicit discharges, two problematic instances come to mind. The city was unable to assess E. coli discharges into MS4 system. The first problem involves Mr. Smith of 806 Merriam Street, who had sewage from neighboring house to migrate on to his property into a drainage area to Market Street Branch. Mr. Smith had made several calls to 311-call center regarding this situation. Mr. Smith had also spoken with Neighborhood Services and ultimately was on the news. The division became aware of the situation from the June 26, 2008 morning news broadcast and began investigation upon arrival to the office that morning. The division determined that the neighbor (808 Merriam) had a sewage leak, which was ultimately repaired. Both the division and the city collected samples and

analyzed them for E. coli. The division shared their sampling points and results with city officials after the city verbally reported their undetectable results to division staff. The division obtained >2419.6 colonies/100ml for samples collected at 808 Merriam (at gate) and at 806 Merriam (at ditch). Although the city had indicated that they initially did not detect any colonies in the samples they collected, once notified of divisional results, the city indicated that the results of the division must have been impacted by animals and not from the neighbor (808 Merriam). Further investigation by the division indicated that a sewage pipe at 808 Merriam had ruptured and was replaced by a plumber. The sewage from 808 Merriam had migrated from the back yard onto the back yard of 806 Merriam and ultimately into the drainage system to Market Street Branch. City officials were determined that E. coli results were due to animals and not the neighbor. The second problem involves Ms. Stein's property at 468 South Crest. A complaint was referred to the city's MS4 program by the division. The city personnel took an E. coli sample of the discharge from a cast iron pipe from the retaining wall of 468 South Crest. The city's result from the E. coli was <1 colony/100 ml in the sample. The division also pulled an E. coli sample from the same pipe. The division obtained a result of >2000 colonies/100 ml in the sample. In both instances, the city was unable to duplicate contamination levels detected by division officials.

- Field screening program

18. **Part II.C.7.c.ii.** The city has failed to adequately train inspectors and to maintain equipment. During the inspection, the division compared the requirements set forth in the MOUs and the job functions of personnel with the type of training classes provided. Based on that comparison, the division surmised that personnel are not adequately trained. For the Water Quality Division, the last documented, sampling training session was in 2006. Based on training records and current personnel, the inspectors determined that not all personnel performing sampling/field-screening jobs have received this training. The training provided by the city did not, for example, instruct personnel on how to calibrate each type of equipment, sampling protocol, proper preservation of samples, chain-of-custody (sample handling), illicit discharge detection and interpretation of data. The city could not provide evidence that equipment is being adequately maintained. For example, the division observed that some sample test kits and some reagents currently in use had expired as far back as 1997 and 2004. The MS4 have no record of calibration and post calibration of equipment being consistently performed. MS4 staff advised that equipment used in the field never undergoes post-calibration verification once it is returned from the field.
19. **Part II.C.7.c.v.** The city opted to screen all outfalls within the MS4 area as opposed to a screening program based on the grid approach. However, the city did not field screen all outfalls. Table II.C.1 of the permit requires dry weather field screening for all outfalls at a frequency of once per five years. Based on

information submitted, the city has only screened major outfalls. The actual number of outfalls within the MS4 system remains unknown.

- Investigation of non-stormwater discharges
20. **Part II.C.7.d.ii.** The city is not providing written notification of non-stormwater discharges to the MS4 system to the division. The city is providing documentation in summary form of smoke testing anomalies. MS4 staff does not perform any sampling/documentation of known sewer overflows nor other possible types of illicit discharges.
 21. **Part II.C.7.d.iii.** The city has failed to adequately train field investigators to investigate illicit discharges and has failed to purchase and maintain the equipment necessary to the effort. All staff should receive training that would allow them to adequately investigate illicit discharges and calibrate equipment utilized in the effort. The city was unable to produce documentation to verify training and calibration of equipment. Testing of illicit discharges should include E. coli. City should carry sample collection bottles to utilize if discharge is observed while in field. City staff did not have proper equipment (including sample bottles, valid sample/monitoring kits, calibrated equipment, etc). Test kits used in the field and various reagents were past expiration dates, some were as old as 1997 and 2004.
 22. **Part II.C.7.h.ii.** The city failed to follow prioritized corrective actions to limit sanitary sewer seepage into MS4 system.
 23. **Part II.C.7.h.iii.** The city did not include E. coli in the tests that are utilized to indicate the presence of sanitary wastes. The city's field screening data includes: Chlorine, pH, Conductivity, Copper, Ammonia, Detergents, Phenol, Hardness, PO4, DO, Color Odor, and Turbidity.
 24. **Part II.C.7.h.iv.** The city failed to identify SSO locations in the annual report and other reports.
- Monitor & Control industrial and high-risk runoff
25. **Part II.C.8.a.** The city has failed to adequately implement a program to monitor and control pollutants in runoff from (i) municipal landfills, (ii) hazardous waste treatment/storage/disposal facility, (iii) industries subject to SARA title III section 313 reporting, and (iv) Industrial facilities that the municipal permit applicant determines are contributing a substantial loading of pollutants to the MS4. The city has identified a total of 290 industries and 3 landfills as part of this program. The city has not adequately performed analysis of these facilities (see Table 5).
 26. **Part II.C.8.b.** The city failed to provide a listing of newly identified facilities, which discharge stormwater into the MS4, in the annual reports.

- Inspections of facilities

27. **Part II.C.8.c.** The city has failed to develop an adequate program and adequately implement a program, as described in Section 4.4.4 on pages 106-112 of Part 2 of application, to inspect the industrial facilities identified in Part II.C.8.a. of the permit. The City identifies 290 industrial facilities and 3 landfills. The city's industrial inspection manual identifies that the sites must be inspected within a 5-year cycle. This is incorrect. The permit requires each site to be inspected within a 3-year cycle. The city has failed to include in their program the inspection of all municipal sites and biosolids-land application sites within the MS4 area.

28. **Part II.C.8.c.i.** The city has failed to inspect each facility once per three years period. The city's plan identifies 290 industrial facilities, and 3 landfills; however, the plan does not include require that all of these facilities be inspected at least once every three years. The 2006-2007 annual report indicated that 36 inspections were performed during that year. The 2005-2006 annual report indicated that 36 inspections were performed during that year. The 2004-2005 annual report indicated that 30 inspections were performed during that year. A total of 112 inspections for the last three years do not meet the permit requirement.

29. **Part II.C.8.c.iv.** The city is required to perform training for their industrial inspectors initially and at least annually thereafter. The city was unable to provide documentation to show training at frequency required.

- Industrial runoff management

30. **Part II.C.8.d.** A review of the public information/outreach education program for the period covering October 2006 to September 2007 revealed that no guidance materials, workshops, and/or technical assistance were provided to industrial facilities on stormwater issues. To the division's knowledge, there has never been any guidance material given to industry.

- Industrial monitoring program

31. **Part II.C.8.e.** The city failed to analyze for all parameters listed in on page 18 of the permit. Table 5 documents which required parameters were not included in the analyses.

32. **Part II.C.8.e.** The city failed to follow sampling SOPs and has an inadequate sampling/monitoring program. In order for data to be valid, standard operating procedures which incorporate EPA approved methods of sampling and data collection, including chain of custody procedures, proper calibration of equipment, use of valid (before expiration date) chemicals, valid preservatives (if needed for samples), proper sample collection practices (grab versus composite, collection site, depth of sampling) should be followed. The city's standard

operating procedures for sampling and data collection referenced the State of Tennessee and EPA protocols. However they were not always followed with regard to chain of custody procedures and sample collection methodology as described below. The chain of custody forms used by the city does not identify who performed the sampling and inaccurately identify the parameters analyzed. With regard to sampling methodology, pH must be measured within 15 minutes of sample collection. In many instances, pH measurements were not taken in the field. Instead, the laboratory used by city MS4 group (Moccasin Bend Wastewater Treatment Plant) measured pH results in the lab well outside of the 15-minute window. The city subsequently reported this data to the State of Tennessee. The report of analysis supplied by the City of Chattanooga MS4 laboratory (Moccasin Bend Wastewater Treatment Plant) does not indicate who performed the analysis and the methodology used for the various analyses. The permit requires that data be analyzed for patterns and trends and also identify potential pollutant sources; however, the inspection did not reveal any evidence of this type of data interpretation being done.

33. **Part II.C.8.e.** The city could provide no evidence that all sampling personnel were trained according to Sampling SOP and State of Tennessee SOPs protocol.

- Construction site runoff

34. **Part II.C.9.e.iii.** While the construction site water quality inspection manual exists personnel were not trained at frequency described in both the permit and the MOU. Personnel were not trained initially or annually thereafter. (See November 6, 2008 e-mail in Appendix C). SWMD construction site inspectors are now known as Soil Engineering Specialist in the Land Development Office.

- Stormwater management program resources

35. **Part II.H.** The Water Quality Manager for the Stormwater Management Program informed TDEC that they are not allowed to replenish the stock of reagents/monitoring test kits until it is depleted even though reagent and monitoring kits are expired. This indicates that the city has not provided adequate finances to implement activities under the Stormwater Management Program.

PART III - SCHEDULES FOR IMPLEMENTATION AND COMPLIANCE

Part III of the permit was not evaluated due to the fact that it was incorporated into the compliance requirements in the Consent Order # 05-0171.

PART IV - NUMERIC EFFLUENT LIMITATIONS (RESERVED)

Part IV of the permit was not evaluated due to the fact that it has no numeric effluent limitations during this permit cycle.

PART V - MONITORING REQUIREMENTS

Wet-weather monitoring

36. **Part V.A.2.a.** The city has failed to monitor all parameters listed in Table V.1. (p. 31) of permit. The city monitored for approximately 26-30% of the required parameters (see Table 2).
37. **Part V.A.2.b.** The city has failed to provide documentation that samples were taken according to 40 CFR 122.26, the sampling methodology outlined in permit.
38. **Part V.A.3.** Seasonal load estimates from January 1996 to May 2004 were calculated by utilizing event mean data published by the United States Geological Survey in "Stormwater Data for Chattanooga, 1992-93". These event mean concentration data, in some cases, were more than 11 years old. Part V.A.3.f. of the permit requires that the next cycle of seasonal loading data be based on more current seasonal sampling program. After reviewing 327 pages of seasonal loading data provided by the city, required data for all major outfalls is lacking. Consequently, not only are the provided data seriously out of date and therefore not reflecting current land uses, but also there are several major outfalls that have not been monitored.

Ambient monitoring

39. **Part V.B.1.** The city has failed to develop a program that fully monitors for parameters identified in Table V.1. (at a minimum). The city conducts yearly monitoring for only one out of the twenty-five required parameters (see Table 1).

Biological sampling

40. **Part V.B.2.** The permit requires biological sampling of two urban streams at least twice per year in two different seasons. The permit also identifies the minimum parameters that are required to be monitored. The city utilized UTC to perform the monitoring in 1999 and 2001. The monitoring studies performed by UTC include a macroinvertebrate study, fish study, and chemical parameter study. However, the data collected during these sampling events are not consistent with the required parameters of the permit (see Table 4). Based on information submitted during the inspection, the city performed biological (parameter)

sampling for only the fall season in year 2005 and 2006 and not also for the spring season as required. For year 2005, the city has failed to perform periodic biological assessments at Citico Creek. The city performed the analysis on the same parameters performed by UTC in 1999 and 2001, which were not to permit requirements (see Table 4).

Watershed characterization

41. **Part V.C.** The city has failed to implement monitoring procedures, collect data, and perform modeling to establish the nature and quantity of non-point source pollutants in the watershed. Data collected is not the data the city indicated that it would collect. Modeling was performed with problematic data. See Table 4.

PART VI - REPORTING REQUIREMENTS

2006-2007 ANNUAL REPORT (Year 11)

42. **Part VI.A.2.b.** The city is required to describe in detail the overall evaluation of the Stormwater Management Program sections: objective of program, major findings (water quality improvements or degradation), major accomplishments, overall program strengths/weaknesses, and future direction of program. In the annual report, the city mentions: (1) the objective of the program in the overview section of the annual report; (2) the major accomplishments in the overview section (pertaining to compliance schedule only); and (3) the future direction in the executive summary of the report with the anticipation of compliance and desire for a new permit. However, the city has failed to include: (1) the major findings; and (2) the overall strength/weaknesses of the program in the annual report.
43. **Part VI.A.2.c.i.** The city does not include a summary table covering annual activities for each of the city's stormwater management program elements.
44. **Part VI.A.2.c.ii.** The city does not include a Summary Table as outlined on page 35 of permit with all detailed activities and accomplishments.
45. **Part VI.A.2.d.i.** The city has failed to include all 18 elements that are required to be addressed in the annual report as outlined on page 36 of the permit. Subsections 1,2,10,11,12,14, and 18 were not addressed in narrative report sections of the annual report.
46. **Part VI.A.2.d.ii.** The city has failed to provide information as required in the Narrative Report section of the annual report as outlined in subsections (1-7) of the permit. The city does not provide a brief discussion each of the SWMP elements. The city does not succinctly discuss in each section of the Narrative

report for each of the elements. The city is merely stating element and basic information. There is no discussion of the element giving general discussion of each element, activities described in the program that have not been fully implemented or completed, summary and discussion of results of activities, summary of all elements, element strengths and weaknesses, assessments of controls, and discussion of element revisions that are summarized elsewhere in the annual report. (See requirements on pages 36-37 of the permit).

47. **Part VI.A.2.e.i.** The city has failed to include sampling data, time of inspection/sample, inventory of all known major outfalls, and estimate of total volume of urban runoff discharged in the city for the year in the annual report. This information must be listed in the annual report under monitoring section.
48. **Part VI.A.2.f.** The city has failed to include summary of Stormwater Management Program and modifications to the monitoring program made during the permit year in the annual report.
49. **Part VI.A.2.g.** The city failed to provide a complete fiscal analysis for each program element. The city has failed to provide fiscal analysis for past calendar year and the next year. The permit requires that the analysis shall indicate the budgets and funding sources for each program element.
50. **Part VI.A.2.h.** The city has failed to include appendices within the annual report defining the analytical data collected from the monitoring program, results of illicit connections screening or dry weather screening; and any other data specifically requested by the division to substantiate statements and conclusions reached in the annual reports. For example:
 - (a) *Page 8 annual report.* The annual report describes a significant drop in Vacuum truck accomplishments in during 2005 to 2006 timeframe as shown in Figure 2 on Page 8. The report should include an appendix that explains that reduction.
 - (b) *Page 12 annual report.* The report stated that thirty-two percent of private stormwater ponds inspected by the city failed to meet minimum maintenance requirements and required some type of enforcement action. The report should have included an appendix that gave the status of these enforcement actions.

PART VII - STANDARD PERMIT CONDITIONS

51. **Part VII.E.** The city has failed to maintain adequate laboratory controls and appropriate quality assurance procedures. The city does not perform required 10% duplicate sampling and blank samples as required. According to an October

31, 2008 e-mail response, the city does not perform blanks or duplicated samples (see Appendix C). State of Tennessee SOPs require 10% of all samples taken must have blanks and duplicates as a quality assurance/quality control measure. MS4 staff advised that blanks and duplicate samples have never been performed. Therefore, QA/QC measures are not followed.

52. **Part VII.E.** The city does not perform adequate calibration checks on laboratory equipment or field equipment. The city does not maintain calibration logbooks in an acceptable manner. Date of calibration, indication of person performing the calibration, reagent value of what is being calibrated, value obtained during calibration must be recorded in a calibration logbook. Equipment values measured are to be recorded in a calibration logbook. MS4 staff advised that field equipment is never rechecked with calibration standards to verify equipment is still calibrated. Many of the calibration standards for the equipment are out of date. This lack of calibration invalidates the data collected.
53. **Part VII.J.1.** The city has failed to collect representative samples and data. The city is not adequately performing sample collection. Grab and composite samples and the utilization of ISCO sampler, are not consistent with sample requirements. ISCO sampler cannot be utilized for samples requiring organic parameter analysis. Sample preservation is not being performed as required by sampling protocol (Standard Methods). The results obtained invalid due to the improper chain of custody procedures, non-compliant sample collection methods, lack of preservatives, untrained sampling staff, improperly calibrated equipment, and sample analysis performed (incomplete parameters). See Tables 1-5. The city's standard operating procedures for sampling and data collection reference State of Tennessee and EPA protocols, but they have not been utilized. (See Appendix B).
54. **Part VII.J.3.b.** The city has failed to indicate the individual who performed sample collection or analytical measurements on monitoring records.
55. **Part VII.J.3.c.** The city, for the required analyses, has failed to provide "the date analyses were performed" on analyses performed at the Moccasin Bend Laboratory.
56. **Part VII.J.3.d.** The city, for the required analyses, has failed to provide "the individual who performed the analyses" on analyses performed at the Moccasin Bend Laboratory.
57. **Part VII.J.4.** For pH, the city measured samples outside of the prescribed holding time; thereby, failing to meet the requirements of 40 CFR part 136.

The information listed in Table 6 is summary of the city's compliance at the time of this CEI.

Table 6: Summary of current cited violations.

Permit Section	Violation cited during CEI- 2008	Permit Section	Violation cited during CEI- 2008
I.D.2.a.	Yes	II.C.7.g.	No
I.D.2.b.	Yes	II.C.7.h.ii.	Yes
I.D.2.c.	Yes	II.C.7.h.iii.	Yes
II.C.1.a.	No	II.C.7.h.iv.	Yes
II.C.1.a.i.	Yes	II.C.8.a.	Yes
II.C.1.a.iv.	Yes	II.C.8.b.	Yes
II.C.1.c.	Yes	II.C.8.c.	Yes
II.C.1.f.	No	II.C.8.c.i.	Yes
II.C.2.e.	No	II.C.8.c.iv.	Yes
II.C.2.f.iii.	No	II.C.8.d.	Yes
II.C.2.g.	No	II.C.9.e.	Yes
II.C.2.h.	No	II.C.9.e.iii.	Yes
II.C.3.a.	Yes	II.H.	Yes
II.C.3.b.	Yes	V.A.2.a.	Yes
II.C.3.e.	Yes	V.A.2.b.	Yes
II.C.4.	Yes	V.A.3.	Yes
II.C.4.a.	Yes	V.B.1.	Yes
II.C.4.b.	Yes	V.B.2.	Yes
II.C.5.	Yes	V.C.	Yes
II.C.5.b.	Yes	VI.A.2.b.	Yes
II.C.5.d.	Yes	VI.A.2.c.	Yes
II.C.6.b.	No	VI.A.2.c.i.	Yes
II.C.6.c.	No	VI.A.2.c.ii.	Yes
II.C.6.d.	No	VI.A.2.d.i.	Yes
II.C.6.e.	Yes	VI.A.2.d.ii.	Yes
II.C.7.a.	Yes	VI.A.2.e.i.	Yes
II.C.7.c.	No	VI.A.2.g.	Yes
II.C.7.c.ii.	Yes	VI.A.2.h.	Yes
II.C.7.c.v.	Yes	VII.E.	Yes
II.C.7.d.ii.	Yes	VII.J.1.	Yes
II.C.7.d.iii.	Yes	VII.J.3.b.	Yes
II.C.7.e.iii.	No	VII.J.3.c.	Yes
II.C.7.e.iv.	No	VII.J.3.d.	Yes
II.C.7.e.v.	No	VII.J.4.	Yes

21

IV. Conclusion

The Compliance Evaluation Inspection found several deficiencies in City of Chattanooga's MS4 Program. The deficiencies were concentrated in the following areas and resulted in the 57 permit violations previously identified in this document.

(1) Monitoring,

- Lack of monitoring for all required parameters
- Improper monitoring procedures
- Lack of documentation for proper data collection

(2) Inspections,

- The water quality team has performed only 30% of the required industrial inspections. City could not verify that all sites as outlined in permit are included in inspection plan.
- City could not provide documentation of inspections for all city facilities.

(3) Training,

- City could not provide documentation to verify all personnel received adequate training.
- The lack of adherence to proper procedures indicates inadequate training.

(4) Financial.

- The city has failed to provide a complete fiscal analysis and itemized sources of funding for each program element in the Year 11 Annual Report as required by Part VI.A.2.g of the permit. A review of the spreadsheet titled city's Fiscal Year 09 Total Requests For Stormwater Fund shows a total decrease of 40% between request and budget funding. The majority of this decrease (\$1,568,533) is associated with salaries and wages. A review of the Water Quality Management Fund (5300) shows a fund and cash balance of approximately \$1.56-million in 2007, and \$1.67-million in 2008. However, the proposed FY09 budget shows a zero amount for fund and cash balance and no appropriation to the capital project fund. Both EPA and TDEC are concerned about the city's ability to meet the funding obligation for the MS4 program and the Order.