

Health Effects Associated with Chemical Emissions from NYS Natural Gas Compressor Stations: 2008-2014

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Table of Contents

| | |
|---|-----------|
| PURPOSE OF THE REPORT | 9 |
| EXECUTIVE SUMMARY | 15 |
| 1. NATURAL GAS COMPRESSOR STATIONS IN NYS..... | 15 |
| 2. TOTAL RELEASES: 40.2 MILLION POUNDS..... | 15 |
| 3. TOTAL RELEASES BY CHEMICAL: 70..... | 16 |
| 4. TOTAL RELEASES BY COMPRESSOR STATIONS: 18..... | 16 |
| 5. TOTAL RELEASES BY DEC REGIONS: 9 | 17 |
| 6. TOTAL RELEASES BY COUNTY: 14 | 17 |
| 7. TOTAL RELEASES BY ZIP CODES: 18 | 18 |
| 8. TOTAL RELEASES PER SQUARE MILE | 18 |
| 9. TOTAL RELEASES: CIRCULAR AREA POPULATION PROFILES..... | 18 |
| 10. TOTAL RELEASES BY HEALTH EFFECTS | 20 |
| 11. VISUALIZING THE DATA..... | 22 |
| Scenario 1 | 22 |
| Scenario 2 | 22 |
| Scenario 3 | 23 |
| Scenario 4 | 24 |
| Scenario 5 | 25 |
| INTRODUCTION | 26 |
| CONTENTS OF THE REPORT | 28 |
| MATERIALS AND METHODS | 29 |
| Health effects..... | 29 |
| National Emissions Inventory | 30 |
| Identification of NYS Natural Gas Compressor Stations..... | 30 |
| ABBREVIATIONS | 31 |
| CHAPTER 1. BACKGROUND..... | 32 |
| 1. INTRODUCTION..... | 33 |
| 1.1. Pollution as a Cause of Human Disease | 33 |
| 1.2. President's Cancer Panel (2010)..... | 34 |
| 1.3. Outdoor Air and Particulate Air Pollution: Known Human Carcinogens..... | 38 |
| 1.4. Expansion of Fracking Operations and Natural Gas Compressor Stations in the U.S..... | 39 |
| 1.5. The Legal Framework for Assessing the Health and Environmental Risks of Natural Gas Compressor Stations..... | 40 |
| 1.6. The Precautionary Principle and Legal Damage Awards..... | 45 |
| 1.2. THE EXISTING LITERATURE | 46 |
| 1.2.1. Peer-reviewed studies of natural gas compressor stations..... | 46 |
| 1.2.2. NYS DEC | 47 |
| 1.2.3. NYS DOH | 47 |
| 1.2.4. National Academy of Science's Health Impact Assessment of Shale Gas Extraction | 47 |
| 1.2.5. U.S. Environmental Protection Agency, Inspector General | 48 |
| 1.2.6. U.S. Agency for Toxic Substances and Disease Registry | 48 |
| 1.3. REQUESTS FOR INFORMATION | 49 |
| 1.3.1. Letter to Mr. Michael Higgins, NYS DEC, Division of Environmental Permits..... | 49 |
| 1.3.2. Letters to Governor Cuomo and Health Commissioner Howard A. Zucker | 49 |
| 1.3.3. Letter to Mr. Christopher Hogan, NYSDEC, Division of Environmental Permits | 50 |
| 1.3.4. Public Statement: Mothers Out Front Mobilizing for a Livable Climate (Monroe County NY) | 50 |

| | |
|--|-----------|
| 1.4. SUMMARY | 51 |
| 1.4.1. A substantial amount of health relevant information is not reaching the public | 51 |
| 1.4.2. Governments' failure to analyze or communicate the results of its own data collection | 52 |
| 1.4.3. DOH's failure to analyze the potential health impacts of compressor station pollution | 52 |
| 1.4.4. Industry and governmental assurances that gas compressor stations "comply with all air quality requirements" and that they therefore pose no unreasonable threat to public health | 53 |
| 1.4.5. President's Obama's Cancer Panel | 55 |

CHAPTER 2. COMPRESSOR STATION RELEASES 58

| | |
|---|-----------|
| 2.1. NUMBER, CATEGORIZATION AND OPERATIONAL STATUS OF FACILITIES..... | 60 |
| 2.2. NYSDEC AIR POLLUTION CONTROL PERMITS AND REGISTRATIONS | 61 |
| 2.2.1. State Facility Permits | 61 |
| 2.2.2. Title V Permits | 62 |
| 2.3. REPORTING REQUIREMENTS FOR COMPRESSOR STATIONS WITH TITLE V PERMITS | 63 |
| 2.4. U.S. EPA NEI REPORTING FOR COMPRESSOR STATIONS | 65 |
| 2.4.1. Compressor Stations with a "Title V Permit" | 65 |
| 2.4.2. Compressor Stations with a "State Facility Permit" | 65 |
| 2.5. TOTAL RELEASES | 68 |
| 2.5a. Releases by Chemical | 68 |
| 2.5c. Releases by Facility | 72 |
| 2.5d. Releases by NYS DEC Region | 96 |
| 2.5e. Releases by County | 98 |

CHAPTER 3: HEALTH EFFECTS 100

| | |
|---|------------|
| 3.1. TOTAL RELEASES BY CHEMICAL | 103 |
| 3.1.1. Nitrogen oxides | 104 |
| 3.1.2. Carbon monoxide | 105 |
| 3.1.3. Volatile organic compounds | 106 |
| 3.1.4. Formaldehyde | 107 |
| 3.1.5. PM10 Primary (Filt + Cond) | 108 |
| 3.1.6. PM 2.5 Primary (Filt + Cond) | 109 |
| 3.1.7. PM Condensable | 110 |
| 3.1.8. Sulfur dioxide | 111 |
| 3.1.9. Acetaldehyde | 112 |
| 3.1.10. Acrolein | 113 |
| 3.1.11. Benzene | 114 |
| 3.1.12. Methanol | 115 |
| 3.1.13. Toluene | 116 |
| 3.1.14. Hexane, n- | 117 |
| 3.1.15. Xylene (mixed isomers) | 118 |
| Table 2.5e. 119 | |
| 3.2. NEOPLASMS (C00-D48) | 121 |
| 3.2.1. Carcinogens by Evidence of Carcinogenicity | 121 |
| 3.2a. Releases by Chemical | 125 |
| 3.2b. Releases by ICD Category | 126 |
| 3.2c. Releases by Facility: Malignant Neoplasms (ICD-10, C00-C97) | 132 |
| 3.2d. Releases by DEC Region | 148 |
| 3.2e. Releases by County | 149 |
| 3.3. DISEASES OF THE BLOOD AND BLOOD-FORMING ORGANS AND CERTAIN DISORDERS INVOLVING THE IMMUNE MECHANISM (D50-D89) ... | 150 |
| 3.3a. Releases by Chemical | 150 |
| 3.3b. Releases by ICD Category | 151 |
| 3.3c. Releases by Facility | 152 |
| 3.3d. Releases by DEC Region | 153 |
| 3.3e. Releases by County | 154 |

| | | |
|--------------|---|------------|
| 3.4. | ENDOCRINE, NUTRITIONAL AND METABOLIC DISEASES (E00-E90) | 157 |
| 3.4a. | Releases by Chemical | 157 |
| 3.4b. | Releases by ICD Category | 158 |
| 3.4c. | Releases by Facility | 159 |
| 3.4d. | Releases by DEC Region | 161 |
| 3.4e. | Releases by County | 162 |
| 3.5. | MENTAL AND BEHAVIORAL DISORDERS (F00-F99) | 163 |
| 3.5a. | Releases by Chemical | 163 |
| 3.5b. | Releases by ICD Category | 164 |
| 3.5c. | Releases by Facility | 166 |
| 3.5d. | Releases by DEC Regions | 168 |
| 3.5e. | Releases by County | 169 |
| 3.6. | DISEASES OF THE NERVOUS SYSTEM (G00–G99) | 171 |
| 3.6a. | Releases by Chemical | 171 |
| 3.6b. | Releases by ICD Category | 172 |
| 3.6c. | Releases by Facility | 173 |
| 3.6d. | Releases by DEC Region | 174 |
| 3.6e. | Releases by County | 175 |
| 3.7. | DISEASES OF THE EYE AND ADNEXA (H00-H59) | 177 |
| 3.7a. | Releases by Chemical | 177 |
| 3.7b. | Releases by ICD Category | 178 |
| 3.7c. | Releases by Facility | 179 |
| 3.7d. | Releases by DEC Region | 180 |
| 3.7e. | Releases by County | 181 |
| 3.8. | DISEASES OF THE EAR AND MASTOID PROCESS (H60-H95) | 183 |
| 3.8a. | Releases by Chemical | 183 |
| 3.8b. | Releases by ICD Category | 184 |
| 3.8c. | Releases by Facility | 185 |
| 3.8d. | Releases by DEC Region | 186 |
| 3.8e. | Releases by County | 187 |
| 3.9. | DISEASES OF THE CIRCULATORY SYSTEM (I00-I99) | 189 |
| 3.9a. | Releases by Chemical | 189 |
| 3.9b. | Releases by ICD Category | 190 |
| 3.9c. | Releases by Facility | 191 |
| 3.9d. | Releases by DEC Region | 192 |
| 3.9e. | Releases by County | 193 |
| 3.10. | DISEASES OF THE RESPIRATORY SYSTEM (J00-J99) | 195 |
| 3.10a. | Releases by Chemical | 195 |
| 3.10b. | Releases by ICD Category | 196 |
| 3.10c. | Releases by Facility | 197 |
| 3.10d. | Releases by DEC Region | 198 |
| 3.10e. | Releases by County | 199 |
| 3.11. | DISEASES OF THE DIGESTIVE SYSTEM (K00-K93) | 201 |
| 3.11a. | Releases by Chemical | 201 |
| 3.11b. | Releases by ICD Category | 202 |
| 3.11c. | Releases by Facility | 203 |
| 3.11d. | Releases by DEC Region | 204 |
| 3.11e. | Releases by County | 205 |
| 3.12. | DISEASES OF THE SKIN AND SUBCUTANEOUS TISSUE (L00-L99) | 207 |
| 3.12a. | Releases by Chemical | 207 |
| 3.12b. | Releases by ICD Category | 208 |
| 3.12c. | Releases by Facility | 209 |
| 3.12d. | Releases by DEC Region | 210 |
| 3.12e. | Releases by County | 211 |
| 3.13. | DISEASES OF THE MUSCULOSKELETAL SYSTEM AND CONNECTIVE TISSUE (M00-M99) | 213 |
| 3.13a. | Releases by Chemical | 213 |
| 3.13b. | Releases by ICD Category | 214 |
| 3.13c. | Releases by Facility | 215 |
| 3.13d. | Releases by DEC Region | 216 |
| 3.13e. | Releases by County | 217 |

| | | |
|--------------|---|------------|
| 3.14. | DISEASES OF THE GENITOURINARY SYSTEM (N00-N99) | 219 |
| 3.14a. | Releases by Chemicals..... | 219 |
| 3.14b. | Releases by ICD Category..... | 220 |
| 3.14c. | Releases by Facility..... | 222 |
| 3.14d. | Releases by DEC Region | 223 |
| 3.14e. | Releases by County..... | 224 |
| 3.15. | PREGNANCY, CHILDBIRTH AND THE PUERPERIUM (O00-O99) | 225 |
| 3.15a. | Releases by Chemical | 225 |
| 3.15b. | Releases by ICD Category..... | 227 |
| 3.15c. | Releases by Facility..... | 228 |
| 3.15d. | Releases by DEC Regions..... | 229 |
| 3.15e. | Releases by County..... | 230 |
| 3.16. | CERTAIN CONDITIONS ORIGINATING IN THE PERINATAL PERIOD (P00-P96) | 232 |
| 3.16a. | Releases by Chemical | 232 |
| 3.16b. | Releases by ICD Category..... | 233 |
| 3.16c. | Releases by Facility..... | 234 |
| 3.16d. | Releases by DEC Region | 235 |
| 3.16e. | Releases by County..... | 236 |
| 17. | CONGENITAL MALFORMATIONS, DEFORMATIONS & CHROMOSOMAL ABNORMALITIES (Q00-Q99) | 240 |
| 3.17a. | Releases by Chemical | 240 |
| 3.17b. | Releases by ICD Category..... | 241 |
| 3.17c. | Releases by Facility..... | 242 |
| 3.17d. | Releases by DEC Region | 243 |
| 3.17e. | Releases by County..... | 244 |
| 3.18. | SYMPTOMS, SIGNS AND ABNORMAL CLINICAL AND LABORATORY FINDINGS (R00-R99) | 246 |
| 3.18a. | Releases by Chemicals..... | 246 |
| 3.18b. | Releases by ICD Category..... | 247 |
| 3.18c. | Releases by Facility..... | 249 |
| 3.18d. | Releases by DEC Region | 250 |
| 3.18e. | Releases by County..... | 251 |

CHAPTER 4. FACILITY PROFILES.....252

| | | |
|-------------|---|------------|
| 4.1. | ALGONQUIN GAS SOUTHEAST COMPRESSOR STATION (PUTNAM, NEW YORK) | 255 |
| 4.1a. | Facility Profile..... | 255 |
| 4.1b. | Health Effects of Facility Releases..... | 256 |
| 4.2. | ALGONQUIN GAS STONY POINT COMPRESSOR STATION (STONY POINT, NEW YORK) | 257 |
| 4.2a. | Facility Profile..... | 257 |
| 4.2b. | Health Effects of Facility Releases..... | 258 |
| 4.3. | DTI E.M. BORGER COMPRESSOR STATION (ITHACA NY) | 259 |
| 4.3a. | Facility Profile..... | 259 |
| 4.3b. | Health Effects of Facility Releases..... | 260 |
| 4.4. | DTI UTICA STATION (FRANKFURT NY) | 262 |
| 4.4a. | Facility Profile..... | 262 |
| 4.4b. | Health Effects of Facility Releases..... | 263 |
| 4.5. | DTI WOODHULL STATION (WOODHULL NY) | 264 |
| 4.5a. | Facility Profile..... | 264 |
| 4.5b. | Health Effects of Facility Releases..... | 265 |
| 4.6. | NFGSC BEECH HILL COMPRESSOR STATION (WILLING NY) | 266 |
| 4.6a. | Facility Profile..... | 266 |
| 4.6b. | Health Effects of Facility Releases..... | 267 |
| 4.7. | NFGSC CONCORD COMPRESSOR STATION (CONCORD NY) | 268 |
| 4.7a. | Facility Profile..... | 268 |
| 4.7b. | Health Effects of Facility Releases..... | 269 |
| 4.8. | NFGSC INDEPENDENCE COMPRESSOR STATION (ANDOVER NY) | 271 |
| 4.8a. | Facility Profile..... | 271 |
| 4.8b. | Health Effects of Facility Releases..... | 272 |
| 4.9. | NFGSC NASHVILLE COMPRESSOR STATION (HANOVER NY) | 273 |
| 4.9a. | Facility Profile..... | 273 |
| 4.9b. | Health Effects of Facility Releases..... | 274 |

| | |
|---|------------|
| 4.10. TGPC COMPRESSOR STATION 224 | 275 |
| 4.10a. Facility Profile | 275 |
| 4.10b. Health Effects of Facility Releases | 276 |
| 4.11. TGPC COMPRESSOR STATION 229 & TEG DEHYDRATION FACILITY (EDEN NY) | 277 |
| 4.11a. Facility Profile | 277 |
| 4.11b. Health Effects of Facility Releases | 278 |
| 4.12. TGPC COMPRESSOR STATION 230-C (LOCKPORT NY) | 279 |
| 4.12a. Facility Profile | 279 |
| 4.12b. Health Effects of Facility Releases | 280 |
| 4.13. TGPC COMPRESSOR STATION 233 (YORK NY) | 282 |
| 4.13a. Facility Profile | 282 |
| 4.13b. Health Effects of Facility Releases | 283 |
| 4.14. TGPC COMPRESSOR STATION 237 (MANCHESTER, PHELPS NY) | 285 |
| 4.14a. Facility Profile | 285 |
| 4.14b. Health Effects of Facility Releases | 286 |
| 4.15. TGPC COMPRESSOR STATION 241 (LAFAYETTE NY) | 287 |
| 4.15a. Facility Profile | 287 |
| 4.15b. Health Effects of Facility Releases | 288 |
| 4.16. TGPC COMPRESSOR STATION 245 (WINFIELD NY) | 289 |
| 4.16a. Facility Profile | 289 |
| 4.16b. Health Effects of Facility Releases | 290 |
| 4.17. TGPC COMPRESSOR STATION 249 (CARLISLE NY) | 291 |
| 4.17a. Facility Profile | 291 |
| 4.17b. Health Effects of Facility Releases | 292 |
| 4.18. TGPC COMPRESSOR STATION 254 (CHATHAM NY) | 293 |
| 4.18a. Facility Profile | 293 |
| 4.18b. Health Effects of Facility Releases | 294 |

| | |
|-------------------|------------|
| REFERENCES | 295 |
|-------------------|------------|

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Purpose of the Report

Is it Safe?

People living in communities where natural gas compressor stations are sited or are proposed, have repeatedly asked: “Is it safe?” This study represents an attempt to answer that crucial question.

Industry’s answer

Each of the compressor stations operating in New York State (NYS) have been approved by the state’s Department of Environmental Conservation (DEC) based on the conclusion that they comply with all federal and state air quality requirements.

When members of the public or local officials question the potential health effects of compressor station pollution, invariably the response from industry, EPA, DEC and DOH is that “all legal requirements have been met” -- the clear **implication** being that if these “legal requirements” have been met, there is no reason to be concerned about adverse health effects.

For example, in a public statement issued by Dominion Transmission concerning its New Market Project, it states: “The FERC approved New Market on April 28, 2016 after 23 months of evaluating all environmental, health and safety concerns associated with the project.” Dominion poses the question, “What will be the environmental and public health concerns?” And answers:

Any emissions from the compressor station will comply with all air quality requirements, which are established to protect the public health, safety and welfare. We would not operate the compressor station if we could not operate it according to stringent air quality regulations.

Ensuring compliance with environmental requirements falls either to the Environmental Protection Agency (EPA) or state environmental agencies (states by delegation), depending on the specific permit and rule. (Dominion 2016)

At best, such fact free statements are disingenuous.

In this connection, the three most essential points are these:

First, federal and state environmental laws and regulations are at best designed to protect the general health of regional populations and often fail to protect any single group of locally exposed persons. The “stringent air quality regulations” that Dominion refers to are those established by EPA for the purpose of controlling regional levels of pollution.

Second, “controlling regional levels of air pollution” is not equivalent to ensuring that the air in a region is free of pollutants that cause illness and early death. The air quality in any given region of the state may fully meet all federal and state air standards even though it is saturated with hundreds of dangerous chemicals and tens of thousands of pounds more are added each and every day.

Third, industry’s assurances are hollow. They provide neither the empirical information nor the theoretical framework necessary for the public and local and state officials need to begin to understand the potential adverse health effects of existing and proposed compressor stations.

Our answer

Our answer to the question, “Is it safe?” is fundamentally different from that of industry and federal and state government.

In our opinion, the routine emissions surrounding the operation of natural gas compressor stations in New York increases the risk for most major categories of human disease in New York but especially in the communities where they are sited.

This conclusion is based on (1) an empirical assessment of the volume and content of compressor station emissions and (2) a comprehensive review of peer-reviewed scholarship associating the chemical constituents of those emissions with known and suspected human disease and early death.

What this study shows

The air in NY contains chemicals that are linked to 19 of 20 major categories of human disease.

There are 56 operational natural gas compressor stations in New York. Based on data collected by the natural gas industry and reported by EPA, we show that in **a 7-year period 18 of these sites released an estimated 40.2 million toxic pollutants made up of 70 different chemicals**. These 70 chemicals are also linked to 19 of 20 major categories of human disease.

Adding 40.2 million pounds of 70 contaminants to air already contaminated makes the air we breathe **more contaminated** and, by extension, increases the potential for human disease. It is, we think, as simple as that.

A few specific examples:

Cancer and air pollution: The International Agency for Research on Cancer, a division of the World Health Organization, is the most authoritative source of information on the effects of chemical and radiologic contamination on human health. In 2016, the Agency released what is perhaps its most important finding: “Outdoor air pollution is carcinogenic to humans.” After reviewing the extensive peer-reviewed literature IARC concluded that (1) in industrialized countries simply breathing the air increases the risk of cancer compared to breathing the uncontaminated air or relatively uncontaminated air and (2) the responsible pollutants are largely the result of human activity, that occur in both rural and urban areas from many different sources.

Although there are hundreds of sources of outdoor air pollution, the source categories that are the largest contributors to most air pollutants in many locations are: vehicle emissions; stationary power generation; other industrial and agricultural emissions; residential heating and cooking; re-emission from terrestrial and aquatic surfaces; the manufacturing, distribution, and use of chemicals; and natural processes. (IARC 2016)

Cancer is the second leading cause of death in the United States and the second leading cause of death in NYS, and in the near future it is very likely to surpass cardiovascular disease, currently the leading cause of death. The 40.2 million pounds of chemicals released by the state’s compressor stations from 2008 to 2014 includes 9.5 million pounds associated with cancer. Of this amount, 7.9 million pounds (83%) is made up of 20 chemicals classified as “known human carcinogens” by one or more authoritative governmental authorities. These cancers are known to cause cancers of the digestive tract (biliary tract, hepatocellular and liver), respiratory tract (lung, nasal cavity and paranasal sinuses), male genital organs (prostate), urinary tract (bladder and kidney), and hemolymphatic organs (acute myeloid leukemia/acute non-lymphocytic leukemia). Adding 5.7 million pounds of carcinogens to the state’s air each year can only increase the risk of cancer.

Birth defects: Fifty-seven of the 70 chemicals releases are associated with congenital malformation and deformations, including nervous system, deformations: eye, ear, face and neck, and circulatory system malformations and deformations.

Reproductive disorders: Thirty-seven chemicals are associated with diseases of the pelvis, genitals and breasts that affect reproduction. For males, this includes: epididymis, low hormone levels, male impotence, reduced fertility, semen (chemical contamination of semen, low amount of semen and low number of swimming semen), seminal vesicle injury, sperm (abnormalities, irregular shape and low number), and sterility. In women these chemicals are associated with diseases of female pelvic organs as well as noninflammatory disorders of female genital tract--both primary infertility (infertility without any previous pregnancy) and secondary infertility (fertility problems occurring in a couple that has conceived on their own and had a child in the past), as well as cervical erosion, effects on the ovaries (damage, weight changes and unspecified effects), menstrual problems including dysmenorrhea, endometrial stromal polyps, and vagina effects.

Circulatory system disease: Cardiovascular disease is the leading cause of death in the United States. In a 7-year period New York's compressor stations released 16 million pounds of cardiovascular toxicants. Compressor station pollutants are linked to hypertensive disease, chronic rheumatic heart diseases, cardiac arrhythmia, heart weight change, increased cardiovascular mortality, acute pulmonary edema, diseases of arteries, arterioles and capillaries (blood vessel changes and regional, general arteriolar or venous dilation).

This information has not previously been reported.

Without hesitation, we can say not only that the volume and known health effects of these pollutants increase the *risk of disease*, but that they will result *in actual illness*. However, given the limited scope of this study, we cannot quantify the nature or extent of potential increased risk.

The public's right-to-know

In our opinion, the public has a right-to-know the basic facts surrounding the operation of a compressor station, including the number and volume of pollutants and their known or suspected health effects. But beyond this basic information, the public also has the right to expect the opportunity to review a scientifically sound study of the potential health impacts of a compressor station *before* it is built.

In the State of New York

Neither industry nor government has provided the public with basic data about the extent of compressor station pollution or its likely health effects, let alone scientifically rigorous health impact statements.

To the public "health impact statements," "risk assessments" and "cost-benefit analysis" are essentially synonymous, but they represent very different types of studies to the public health community.

In this connection, we would make three points. First and foremost, "health impact statements," "risk assessments" or "cost-benefit analysis" as conducted by federal and state agencies or industry and its paid consultants (a) rarely predict the likely qualitative impact of pollution, as any number of investigators have noted, (b) seldom present relevant information to the public in coherent fashion, or (c) never present a morally persuasive argument why some populations should be subjected against their will to greater levels of pollution with its attendant risk than other (usually more affluent) populations. Generally, the definition of "acceptable risk" adopted by industry and government is one death per 1 million people who are exposed, though various industries have

sought (in some cases successfully) to lower the accepted standard to one death per 100,000 exposed—a tenfold increase.

Second, notwithstanding our skepticism of the value or “health impact statements” and “risk assessments” it is worth noting that we could not find a single existing or proposed compressor station in NYS that has been the subject of such reviews by industry, NYS’s DEC, NYS’s Department of Health (DOH), the U.S. Environmental Protection Agency (EPA) or the U.S. Federal Energy Regulatory Commission (FERC). One would not expect the industry to perform such an analysis and, if it did, their findings would not be those of a disinterested investigator. Much the same could be said of FERC, which is widely viewed as a “captive agency,” i.e., an agency effectively controlled by the industry it is responsible for regulating. It is not the responsibility of DEC to perform health-based analyses, nor does EPA routinely require health impact statements. This only leaves the DOH which, unfortunately, is missing in action.

And finally, the lack of information about the potential adverse health effects of compressor stations on local communities has played no role in preventing their construction or expansion.

This study’s rationale

All industrial development involves tradeoffs between short- and long-term economic benefits (real and perceived) and potential harm to human health and the environment.

To date, the criticisms of the expansion of the natural gas industry in the U.S. have focused primarily on four concerns.

First: exaggerated claims for the advantages of using natural gas compared to coal in terms of global warming. As a rule, burning natural gas to produce electricity produces half as much carbon monoxide as coal. While natural gas combustion produces fewer greenhouse gases than coal at the point of combustion, when the chemicals released in the production, transportation and distribution of natural gas are taken into account, the comparative advantage of natural gas are far less clear cut (Dove 2016, Grossman 2015, Moskowitz 2015, UCS, Zielinski S. 2014). Fugitive emissions of methane, roughly 30 times more potent as a heat-trapping gas than carbon dioxide, are of particular concern.

Second: the more profound and most important argument that whatever natural gas’s relative advantage compared to coal, the planet cannot sustain continued reliance on fossil fuels. In this connection, perhaps most startling is a recent study showing that climate sensitivity is nonlinear. Based on past, current and probable future greenhouse gas emissions, the Earth could heat up as much as 6°C (almost 11°F) in a single lifetime. (Friedrich 2016). Scientists estimate the range of sea rise from 1 to 6 meters (1.3 to 20 feet). The Australian Earth and paleoclimate scientist, Andrew Glikson, describes the likely future: “The consequences of open ended rise in atmospheric CO₂ are manifest in the geological record. . . At 460 ppm CO₂-equivalent, the climate is tracking close to the upper stability limit of the Antarctic ice sheet, defined at approximately 500 ppm. Once transcended, mitigation measures would hardly be able to re-form the cryosphere. According to Joachim Schellnhuber, Director of the Potsdam Climate Impacts Institute and advisor to the German government: ‘We’re simply talking about the very life support system of this planet.’ . . . Humans cannot argue with the physics and chemistry of the atmosphere. What is needed are urgent measures including: Deep cuts in carbon emissions; Parallel Fast track transformation to non-polluting energy utilities – solar, solar-thermal, wind, tide, geothermal, hot rocks; Global reforestation and re-vegetation campaigns, including application of biochar. The alternative does not bear contemplation.” (Glikson 2010) Twenty-two scientists writing in *Nature* depict the situation with equal starkness: “[T]he next few decades offer a brief window of opportunity to minimize [but not prevent] large-scale

and potentially catastrophic climate change that will extend longer than the entire history of human civilization thus far. “ (Clark et al. 2016).

Third: the damage fracking does to local environments in the form of air, water and soil contamination. In February 2014, there were an estimated 1.1 million active oil and gas wells in the U.S. In August 2015, the number of active and dry holes was estimated to be 1.7 million (Kelso 2015). To frack a single well requires up to 5 million gallons of water, and wells can be fracked multiple times—18 times or more. If we assume that each of the 1.1 million active wells were fracked once and used 5 million gallons of water, it means ~12 trillion gallons of water has been contaminated with hundreds of toxic chemicals. This waste water is either collected in surface ponds (many of which are unlined) where it inevitably contaminates surface and groundwater and the air when it vaporizes, or else it is injected underground where it contaminates groundwater and the environment for decades if not centuries.

Fourth: the health impacts of fracking on local communities. A study by the Wall Street Journal examining fracking operations in 11 of the biggest energy producing states found that, “At least 15.3 million Americans live within a mile of a well that has been drilled since 2000. That is more people than live in Michigan or New York City.” (WSJ)

To these concerns, we would add a fifth: the health and environmental damage caused by the transportation of natural gas. To our knowledge, this subject has not been previously addressed.

Much of the environmental damage caused by the natural gas industry is largely unseen. The physical damage to local environments where fracking occurs is in part obvious to anyone who cares to look. Roads are cut through forests and hillsides, large bodies of wastewater are collected in ponds and lagoons, dust from diesel trucks and construction equipment is constant as is the noise they make in what were once relatively quiet rural places. But the chemical pollution associated with the extraction, refinement, transportation, storage and combustion of natural gas for energy and heat is largely invisible. Industry advertisements tout natural gas as the "clean alternative" to coal--and in some ways, it is, though it's comparative advantages are wildly exaggerated. But part of what makes natural gas "clean" is that the public can't see the pollution it causes. One reason most people are unaware and unconcerned by pollution associated with unconventional gas development (UGD) is because most don't live in areas where fracking takes place or compressor stations are sited. But more fundamentally we're unconcerned by the UGD pollution because for the most part it's invisible as are its impacts on the public's health--realities which are denied both by the industry and its supporters in and out of government.

The task we set for ourselves here, is to show what the eye can't see: the volume of pollution associated with the transportation of natural gas in New York and its potential to harm human health. The potential health impacts of the large volumes of pollutants generated by natural gas compressor stations have not been addressed, let alone answered, by those arguing for their construction and expansion.

This report has been prepared to provide the data necessary to understand and evaluate the potential immediate and long-term health outcomes connected with the pollution generated by the routine operations of natural gas compressor stations in New York State (NYS) by examining the actual volume of airborne releases generated by 18 plants and the diseases associated with the chemical pollutants they contain. It is directed at 4 primary audiences:

- Communities with existing compressor stations (to help them recognize the potential adverse health outcomes associated with their continued operation).

- Communities where compressor stations are proposed (to help them understand the potential health threats their construction and operation will introduce).
- Physicians and health practitioners in affected communities.
- Public officials responsible for protecting the safety and health of the public.

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Executive Summary

1. Natural Gas Compressor Stations in NYS

This report analyzes the emissions data for 18 as reported to the National Emissions Inventory (NEI) of the U.S. Environmental Protection Agency (EPA) as point sources of air pollution for the period 2008 to 2014.

For the period 2008 to 2014, a total of 60 compressor stations were operational or seeking state and federal approval: operational (54), approved (3) denied, awaiting decision (2), permit denied (1). National Emissions Inventory data is available for 18 of the state's 54-operational natural gas compressor stations.

Four operational stations are seeking significant modifications requiring DEC approval.

Eighteen of the state's 54 operational compressor stations are classified as "major polluters" and operate under Title V of the Clean Air Act (CAA). Pollution data for these sites is part of NEI's point source data set. These 18 sites are the subject of this analysis.

The remaining 36 operational stations are permitted as a NYS "Air State Facility."

GHS emissions data is only available for 8 of the 18 compressor stations for which NEI data is available.

(Table 2.4.2.)

2. Total Releases: 40.2 million pounds

For the period 2008 to 2014, an estimated 1.5 billion pounds of point sources of air pollution were reported to NEI by facilities in NYS.

Releases from the state's national gas compressor stations accounted for approximately 40.2 million pounds or 2.7% of total on-site pollution reported to NEI.

This amounts to an annual average of 5.7 million pounds or 478,485 pounds per month, 15,731 pounds per day, 655 pounds per hour.

If each of the state's 19.8 million residents were given their fair share, each would receive a little more than 2 pounds over 7 years.

Analyzing emissions by each site's 5-digit NAICS code, based on NEI data national gas compressor stations were the 6th largest point (stationary) source of air-pollution in NYS. (If we were to include other sources of air pollution associated with natural gas not included in NAICS 48621, the volume and percentage would be significantly higher. By far the point source of air pollution in NYS is electric power generation (NAICS code 22111) which accounts for approximately 42.3% of the state total. A significant part of this amount is generated by burning natural gas.)

3. Total Releases by Chemical: 70

NYS's compressor stations reported releasing 70 individual chemicals or chemicals categories in the period 2008 to 2011 totaling approximately 40 million pounds. The volume of releases varies tremendously. Twelve chemicals have reported releases of less than one pound. **The largest pollutant, nitrogen oxides, had releases totaling 18.1 million pounds or 45.2% of the aggregate.** Carbon monoxide ranked second (12.4 million pounds or 31%), followed by volatile organic compounds as a group (4.9 million pounds or 12.3%), formaldehyde (1,309,336 pounds or 3.27%), and PM10 Primary (Filt + Cond) (1,259,744 pounds or 3.15%). These five chemicals accounted for 95% of the total.

4. Total Releases by Compressor Stations: 18

All 18 compressor stations reporting to NEI reported toxic emissions which totaled 40,192,733 pounds.

The volume of total pollution by station varied widely. The lowest amount reported was one-quarter of a million pounds--a still considerable sum.

The largest release was from Tennessee Gas Pipeline Company's (TGPC) Compressor Station 245 in Herkimer County: 10.5 million pounds or slightly more than one-quarter (26.1%) of the state total. TGPC's Compressor Station 229 & TEG Dehydration Facility in Erie County ranked second (5.1 million pounds or 12.8%), followed by TGPC's Compressor Station 249 in Schoharie County (4.3 million pounds or 10.8%).

These three facilities accounted for 19.9 million pounds or slightly less than one-half (49.54%) of all releases.

The top 5 stations accounted for 25.3 million pounds or slightly less (63.1%) than two-thirds of the state total.

Total Compressor Station Releases by Station: 2008-2014

| Rank | Facility | County | Pounds | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 5 |
|------|----------------------|------------|------------|---|---|---|---|---|---|---|---|---|----|---|
| 1 | TGPC CS 245 | Herkimer | 10,465,389 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 5 |
| 2 | TGPC 229 & TEG DF | Erie | 5,124,427 | 1 | 2 | 3 | 4 | 5 | | | | | | |
| 3 | TGPC CS 249 | Schoharie | 4,323,285 | 1 | 2 | 3 | 4 | | | | | | | |
| 4 | TGPC CS 241 | Onondaga | 3,039,661 | 1 | 2 | 3 | | | | | | | | |
| 5 | TGPC CS 254 | Columbia | 2,393,661 | 1 | 2 | 4 | | | | | | | | |
| 6 | TGPC CS 237 | Ontario | 2,298,394 | 1 | 2 | 3 | | | | | | | | |
| 7 | AGT Stony Point CS | Rockland | 2,013,478 | 1 | 2 | | | | | | | | | |
| 8 | NFGSC Concord CS | Erie | 1,733,171 | 1 | 7 | | | | | | | | | |
| 9 | AGT Southeast CS | Putnam | 1,688,815 | 1 | 7 | | | | | | | | | |
| 10 | NFGSC Beech Hill CS | Allegany | 1,387,592 | 1 | 4 | | | | | | | | | |
| 11 | NFGSC Independ. CS | Allegany | 1,353,931 | 1 | 3 | | | | | | | | | |
| 12 | TGPC CS 224 | Chautauqua | 1,146,797 | 1 | 1 | | | | | | | | | |
| 13 | DTI Woodhull Station | Steuben | 829,223 | 8 | | | | | | | | | | |
| 14 | DTI Borger CS | Tompkins | 780,159 | 8 | | | | | | | | | | |
| 15 | NFGSC Nashville CS | Chautauqua | 622,791 | 6 | | | | | | | | | | |
| 16 | TGPC CS 230-C | Niagara | 485,610 | 5 | | | | | | | | | | |
| 17 | DTI Utica Station | Herkimer | 281,369 | 3 | | | | | | | | | | |
| 18 | TGPC CS 233 | Livingston | 224,978 | 2 | | | | | | | | | | |

40,192,733

5. Total Releases by DEC Regions: 9

NYS DEC divides the state's 62 counties into 9 regions. The 18 operational compressor stations reporting to NEI are in 6 of NYS's 9 DEC regions encompassing 46 counties: 3-Lower Hudson Valley: 2, 4-Capital Region/Northern Catskills: 2, 6-Western Adirondacks/Eastern, Lake Ontario: 2, 7-Central New York: 2, 8-Western Finger Lakes: 3, 9-Western New York: 7. **Region 9, Western New York, ranked first with an estimated 11.9 million pounds (29.5%), closely followed by Region 2 (10.7 million pounds or 26.7%).** Region 3 reported 6.7 million pounds (16.7%). These three regions accounted for nearly three-fourths (73%) of the state total.

Total Compressor Station Releases by DEC Region: 2008-2014

| Rank | DEC Region | Pounds | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|------|-------------------------------------|------------|---|---|---|---|---|---|---|---|---|----|----|----|
| 1 | 9: Western New York | 11,646,722 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 2 | 6: W. Adirondacks / E. Lake Ontario | 10,746,758 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 3 | 4: Capital Region / N. Catskills | 6,716,946 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | | | | | |
| 4 | 7: Central New York | 3,819,820 | 1 | 2 | 8 | | | | | | | | | |
| 5 | 3: Lower Hudson Valley | 3,702,293 | 1 | 2 | 7 | | | | | | | | | |
| 6 | 8: Western Finger Lakes | 3,352,596 | 1 | 2 | 3 | | | | | | | | | |

6. Total Releases by County: 14

The 18-operational natural gas compressor stations reporting to NEI are located in 14 of New York's 62 counties: Allegany, Chautauqua, Columbia, Erie, Herkimer, Livingston, Niagara, Onondaga, Ontario, Putnam, Rockland, Schoharie, Steuben, and Tompkins. **Herkimer County ranked first with 10.7 million pounds or slightly more than one-fifth of the total (26.7%),** followed by Erie County with 6.9 million pounds (17.1%), and Schoharie with 4.3 million pounds (10.8%). These three counties accounted for slightly more than one-half (54.6%) of all releases: 22 million pounds. The top five counties were responsible for 27.7 million pounds or slightly more than two-thirds (69%) of the aggregate.

Total Compressor Station Releases by County: 2008-2014

| Rank | County | DEC Region | Pounds | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|------|------------|--------------------------------|------------|---|---|---|---|---|---|---|---|---|----|----|----|
| 1 | Herkimer | 6: W Adirondacks/E. L Ontario | 10,746,757 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 2 | Erie | 9: Western New York | 6,857,598 | 1 | 2 | 3 | 4 | 5 | 6 | 9 | | | | | |
| 3 | Schoharie | 4: Capital Region/N. Catskills | 4,323,285 | 1 | 2 | 3 | 4 | 3 | | | | | | | |
| 4 | Onondaga | 7: Central New York | 3,039,661 | 1 | 2 | 3 | | | | | | | | | |
| 5 | Allegany | 9: Western New York | 2,741,523 | 1 | 2 | 7 | | | | | | | | | |
| 6 | Columbia | 4: Capital Region/N. Catskills | 2,393,660 | 1 | 2 | 4 | | | | | | | | | |
| 7 | Ontario | 8: Western Finger Lakes | 2,298,394 | 1 | 2 | 3 | | | | | | | | | |
| 8 | Rockland | 3: Lower Hudson Valley | 2,013,478 | 1 | 2 | | | | | | | | | | |
| 9 | Putnam | 3: Lower Hudson Valley | 1,688,814 | 1 | 7 | | | | | | | | | | |
| 10 | Chautauqua | 9: Western New York | 1,561,991 | 1 | 6 | | | | | | | | | | |
| 11 | Steuben | 8: Western Finger Lakes | 829,223 | 8 | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | |
|----|------------|-------------------------|---------|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| 12 | Tompkins | 7: Central New York | 780,159 | ⑧ | | | | | | | | | | | | | | | |
| 13 | Niagara | 9: Western New York | 485,609 | ⑤ | | | | | | | | | | | | | | | |
| 14 | Livingston | 8: Western Finger Lakes | 224,978 | ② | | | | | | | | | | | | | | | |

7. Total Releases by Zip Codes: 18

The 18 operational compressor stations reporting to NEI are in 18 zip codes. **Compressor stations were responsible for 92% of all recorded industrial emissions in their respective zip codes.** In 14 of these zip codes, emissions from natural gas compressor stations were the **only** point source of air pollution reported by NEI.

8. Total Releases per Square Mile

The distance and direction pollution travels from each natural gas compressor station on any given day (or any hour) is dependent on many factors, including: the height of the stack, chemical composition of the fuel, chemical composition of emissions, meteorological conditions (wind speed and direction, atmospheric stability and cloud cover), as well as local and regional geographical features.

Absent an independent analysis, most epidemiological studies assume that if stacks are short (which is the case for NYS compressor stations), on a typical day most air pollution that is inhaled has traveled a relatively short distance from a plant—something on the order of less than 10 miles—recognizing that on certain days pollution from a single plant can travel hundreds or even thousands of miles before it reaches the ground and is inhaled.

If we assume that the 10.5 million pounds of toxic releases generated by the largest polluter, TGPC's Compressor Station 245, fell within a 1-mile radius of the plant (a 2-mile diameter circle of 3.14 square miles), it amounts to 3.3 million pounds per square mile or approximately 0.12 pounds per square foot.

If, instead, we assume it fell within 1.5-mile radius of the plant (a 3-mile diameter circle of 7.07 square miles), it amounts to 1.5 million pounds per square mile.

9. Total Releases: Circular Area Population Profiles

The number of people in New York State exposed to air pollution from natural gas compressor stations is significantly larger than generally recognized.

10-Mile Radius: Air pollution from a compressor station can easily travel 10 miles or more before returning to ground level. ***Approximately 1.6 million people live within 10 miles of the 18 natural gas compressor stations analyzed in this report—more than 1 out of 8 New Yorkers or 12.5% of the population, which works out to about 25 pounds per person over 7 years.*** At this 10-mile radius, people in 31 counties are potentially breathing air contaminated by compressor station pollutants: NY (27), CT (1), and PA (3).

20-Mile Radius: Expanded to 20 miles the number potentially affected is 5.7 million (more than 1 out of every 3 people) in 52 counties: NY (39), CT (3), MA (1), NJ (3), and PA (6).

2-Mile Radius: Approximately 33,516 people live within a 2-mile radius. If we assume all the pollution was limited to this radius, it works out to 1,201 pounds per person over 7 years.

(See section 2.5c.1. for more details)

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10. Total Releases by Health Effects

The 70 chemicals released by NYS's natural gas compressor stations are linked to all 17 of the major categories of human disease as classified by the International Statistical Classification of Diseases and Related Health Problems, 10th edition (ICD-10). These are summarized in the table below.

Most chemicals are known to cause multiple categories of diseases. Formaldehyde is a good example. NEI shows releases totaling approximately 1.3 million pounds of this chemical.

Formaldehyde is a known human carcinogen, so it is included as a chemical associated with neoplasms (ICD-10, Chapter 2). But it is also associated with virtually every other major category of human disease, so it would be included as contributing to the totals in the table below for chapters 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14, 15, 16, 17, and 18.

There were, for example 9.5 million pounds of 59 chemicals related to neoplastic diseases (malignant and benign neoplasms) released by 18 facilities in 14 counties, averaging 1.4 million pounds annually (ICD-10, Ch. 2). Or, to put it differently, 23.9% of all 40.2 million pounds of toxic chemicals released are carcinogens.

There were 16.2 million pounds of pollutants associated with circulatory diseases such as heart attacks and strokes (ICD-10, Ch. 9).

| ICD Ch. | Disease \ Disorders | Chemicals | Facilities | Counties | DEC Reg. | Pounds Annual Average | Pounds Total | % of Total Lbs. |
|---------|---|-----------|------------|-----------|----------|-----------------------|-------------------|-----------------|
| 2 | Neoplasms | 59 | 18 | 14 | 9 | 1,362,610 | 9,538,272 | 23.9 |
| 3 | Blood and blood-forming organs and certain disorders involving the immune mechanism | 41 | 18 | 14 | 9 | 2,678,763 | 18,751,319 | 47.0 |
| 4 | Endocrine, nutritional and metabolic | 51 | 18 | 14 | 9 | 1,016,765 | 7,117,352 | 17.8 |
| 5 | Mental and behavioral | 34 | 18 | 14 | 9 | 2,678,042 | 18,746,295 | 47.0 |
| 6 | Nervous system | 42 | 18 | 14 | 9 | 2,713,070 | 18,991,490 | 47.6 |
| 7 | Eye and adnexa | 40 | 18 | 14 | 9 | 3,547,275 | 24,830,922 | 61.8 |
| 8 | Ear and mastoid process | 15 | 18 | 14 | 9 | 2,494,582 | 17,462,077 | 43.5 |
| 9 | Circulatory system | 31 | 18 | 14 | 9 | 2,321,403 | 16,249,821 | 40.4 |
| 10 | Respiratory system | 51 | 18 | 14 | 9 | 5,663,824 | 39,646,765 | 98.6 |
| 11 | Digestive system | 45 | 18 | 14 | 9 | 5,496,041 | 38,472,286 | 95.7 |
| 12 | Skin and subcutaneous tissue | 48 | 18 | 14 | 9 | 3,963,161 | 27,742,125 | 69.0 |
| 13 | Musculoskeletal system and connective tissue | 17 | 18 | 14 | 9 | 176,168 | 1,233,174 | 3.1 |
| 14 | Genitourinary system | 43 | 18 | 14 | 9 | 5,706,861 | 39,948,030 | 99.4 |
| | 1. Genitourinary system: urinary system | 33 | 18 | 14 | 9 | 915,867 | 6,411,070 | 16.0 |
| | 2. Genitourinary system: pelvis, genitals and breasts | 37 | 18 | 14 | 9 | 5,706,424 | 39,944,967 | 99.4 |
| 15 | Pregnancy, childbirth and the puerperium | 18 | 18 | 14 | 9 | 2,803,817 | 19,626,720 | 48.8 |
| 16 | Certain conditions originating in the perinatal period | 20 | 18 | 14 | 9 | 3,215,181 | 22,506,319 | 56.0 |
| 17 | Congenital malformations, deformations, chromosomal abnormalities | 59 | 18 | 14 | 9 | 5,663,578 | 39,645,048 | 98.7 |
| 18 | Symptoms, signs and abnormal clinical and laboratory findings, nec | 43 | 18 | 14 | 9 | 5,663,743 | 39,646,203 | 98.7 |
| | All Releases | 70 | 18 | 14 | 9 | 5,741,819 | 40,192,733 | 100% |

NYS Compressor Station Toxicants: 2008-2014

| | |
|---|-------------|
| Total Releases (millions of pounds) | 40.2 |
| 2. Cancer | 9.5 |
| 3. Blood & Immune | 18.8 |
| 4. Endocrine, Metabolic | 18.8 |
| 5. Mental and behavioral | 18.7 |
| 6. Nervous system | 19.0 |
| 7. Eye and adnexa | 24.8 |
| 8. Ear and mastoid process | 17.5 |
| 9. Circulatory system | 16.3 |
| 10. Respiratory system | 39.6 |
| 11. Digestive system | 38.5 |
| 12. Skin and subcutaneous tissue | 27.7 |
| 13. Musculoskeletal system\connective tissue | 1.2 |
| 14. Genitourinary system | 39.9 |
| Urinary system | 6.4 |
| Pelvis, genitals and breasts | 40.0 |
| 15. Pregnancy, childbirth, puerperium | 19.6 |
| 16. Perinatal period | 22.5 |
| 17. Birth defects, chromosomal abnormalities | 39.6 |
| 18. Symptoms, signs, findings nec | 39.6 |

11. Visualizing the Data

Scenario 1

It's difficult to visualize what 40.2 million pounds of pollution looks like.

The following might help.

Everyone's familiar with a 5-pound bag of flour. There's one in every kitchen.

Assume that the 40.2 million pounds of toxic pollution generated by the state's 18 compressor stations has the same density as flour, i.e., that 5-pounds of pollution would fit in a bag equivalent in size to a 5-pound bag of flour.

To put the 40.2 million pounds of compressor station pollution in 5-pound bags would require 8,038,545 bags.

Scenario 2

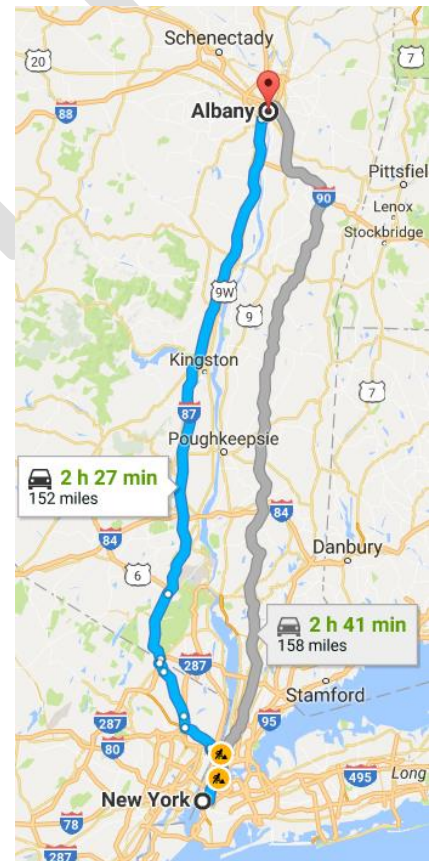
Let's go a step further. Let's say we wanted to take our 8 million bags of toxic pollution for a ride.

Assume we loaded all 7 years of compressor station pollution onto 1-ton pickup trucks.

Each pickup could safely carry 1,000 pounds or 200 5-pound bags.

So, we'd have to load up 40,193 1-ton pickups (40.2 million pounds / 1,000)

Let's say each pickup is 20' long and we were backed up on the highway literally bumper to bumper: Our line of 40,193 1-ton pickup trucks would stretch 152 miles-- exactly the distance from New York City to Albany.



Scenario 3

Another scenario.

Let's assume we aren't stuck in traffic and instead our 40,193 trucks filled with compressor station pollution are traveling 65 mph on the nation's highways with 576 feet between each truck (the distance the average driver needs to react in 6 seconds).

In this case our pollution convey would stretch about 4,537 miles (40,193 trucks x 596 feet / 5,280 feet) -- almost long enough to stretch from the easternmost location in the U.S., Houlton Maine, down to Miami, back up to Tampa, along the Gulf Coast to Houston, across Texas, New Mexico, Arizona and California to Los Angeles.

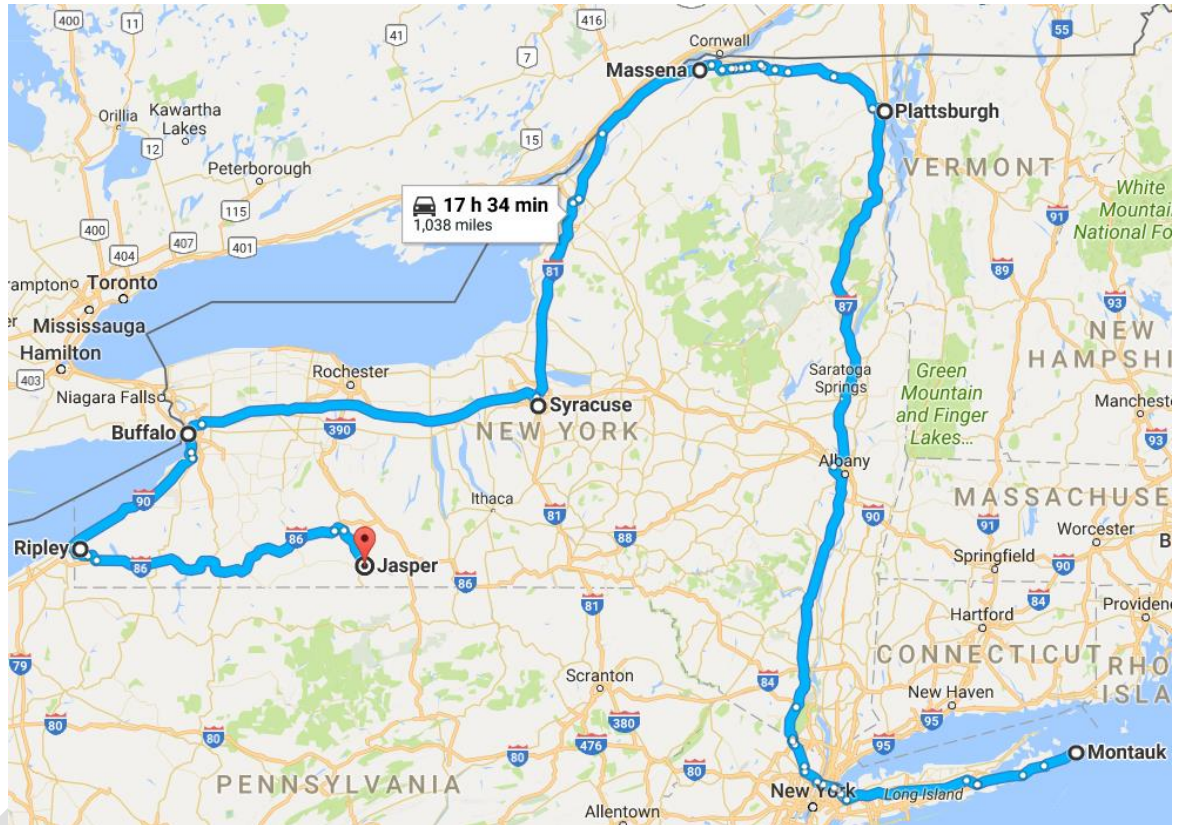


Scenario 4

A flour bag is 8" tall.

If we laid each of our 8,038,545 bags on their side they would stretch approximately 1,034 miles.

This is enough bags to line the interstates from Montauk Long Island, up to Plattsburgh, west to Massena, down to Syracuse, west to Buffalo, down to Ripley and east to Jasper.



Scenario 5

Everyone knows what a football field looks like.

New Era Field, home to the Buffalo Bills, is the only professional football field in NYS.

A football field measures 160' x 360' (57,600 sq. ft.).

Our flour bags measure 8" x 6" x 5".

If we lay a flour bag on its widest sides, it measures 8" x 6" or 48 sq. inches.

It takes 14,400 bags to cover a football field with a single layer of 5-lb. bags to a height of 5".

If we placed all 8 million bags one atop the other, we could cover New Era Field to a height of about 97' -- roughly the height of a 10-story office building.



Introduction

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Contents of the Report

This report is divided into four chapters.

- Chapter 1, Background: provides a brief review of the issues which motivated this report.
- Chapter 2, Compressor Station Releases: identifies the locations of natural gas compressor stations in New York State (NYS) and the total volume of air pollution they generate based on the three most recent years of data collected by the U.S. Environmental Protection Agency's (EPA) National Emissions Inventory. Detailed analysis of total air pollution is analyzed by chemical, chemical category, NYS Department of Environmental Conservation (DEC) Regions, counties, and zip codes.
- Chapter 3, Health Effects: provides a detailed analysis of compressor station air pollutants for each of 17 major disease categories as defined by the International Classification of Diseases, 10th edition (ICD-10). For each disease category, gas compressor station air pollutants are analyzed by chemicals, by ICD categorization, facilities, DEC regions, and by counties.
- Chapter 4, Facilities: provides a profile of each of the compressor station studied in this report along with a summary of the health effects associated with the chemicals each generates.

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Materials and Methods

Health effects

To facilitate the identification of toxic exposures and their potential health and environmental impacts, the author has created several proprietary SQL-compliant databases used in environmental and epidemiological studies:

1. Chemical Database: Contains essential data on slightly more than 21,000 unique chemicals or chemical categories, including names, synonyms, identification numbers, chemical and physical characteristics, and inclusion in federal, state and international reporting programs.
2. Occupational Database: Contains essential data on approximately 500 occupations or occupational grouping for which there are epidemiological assessments. Occupations are categorized according to the U.S. Bureau of Labor Statistics Standard Occupational Classification (2010).
3. Health Effects Database: Indexes approximately 120,000 peer-reviewed studies examining the impacts of toxic chemicals on human health and the environment. Each article is indexed by the relevant ICD-10 code. Fields include: chemical name or identifier, author, full reference, PMID, DOI, subject (human/animal), acute/chronic exposure, route of exposure (inhalation, skin, drinking water, diet, etc.). This database can be used to identify all health effects associated with a specific chemical or chemical category.

National Emissions Inventory

The rationale for the creation of NEI and some of its limitations are described in the draft of NEI's Technical Support Document, published in June 2014 (USEPA 2014):

The NEI is created to provide EPA, federal and state decision makers, the U.S. public, and other countries the U.S.'s best and most complete estimates of CAP and HAP emissions. While EPA is not directly obligated to create the NEI under the Clean Air Act, the Act authorizes the EPA Administrator to implement data collection efforts needed to properly administer the NAAQS program. Therefore, the Office of Air Quality Planning and Standards (OAQPS) maintains the NEI program in support of the NAAQS. Furthermore, the Clean Air Act requires states to submit emissions to EPA as part of their State Implementation Plans (SIPs) that describe how they will attain the NAAQS. The NEI is used as a starting point for many SIP inventory development efforts and for states to obtain emissions from other states needed for their modeled attainment demonstrations.

While the NAAQS program is the basis on which EPA collects CAP emissions from the state, local, and tribal (S/L/T) air agencies, it does not require collection of HAP emissions. For this reason, the **HAP reporting requirements are voluntary**. [author's emphasis] Nevertheless, the HAP emissions are an essential part of the NEI program. These emissions estimates allow EPA to assess progress in meeting HAP reduction goals described in the Clean Air Act 4 amendments of 1990. These reductions seek to reduce the negative impacts to people of HAP emissions in the environment, and the NEI allows EPA to assess how much emissions have been reduced since 1990.

If "HAP reporting requirements are voluntary" by extension it seems reasonable to conclude that EPA isn't legally obligated to analyze the results of the inventory to identify all potential health impacts, to prioritize chemicals in terms of their greatest harm to health, or communicate this information to the general public or state regulators effectively.

The National Emissions Inventory is available to the public on EPA's website.

Data is published every 3 years. This report uses the last 3 years of published data: 2008, 2011, and 2014.

To estimate total releases over the 7-year period from 2008 through 2014, the average for 3 years was determined and multiplied by 7. Given the characteristics of the data, performing these calculations at different levels (e.g., facility versus country) sometimes produces slightly different totals, though the difference is small and not statistically meaningful.

Identification of NYS Natural Gas Compressor Stations

The method used to identify natural gas compressor stations operating in NYS is described in Chapter 2.

Abbreviations

| | |
|--------|---|
| AG | Algonquin Gas Transmission LLC |
| DTI | Dominion Transmission Inc. |
| NFGSC | National Fuel Gas Supply Corp. |
| CFR | Code of Federal Regulations |
| ch | Chemical or chemicals |
| cs | Compressor Station |
| DEC | New York State Department of Environmental Conservation |
| deh | Dehydration |
| DOH | New York State Department of Health |
| EPA | U.S. Environmental Protection Agency |
| est'd | estimated |
| Fac | Facility or facilities |
| TGPC | Tennessee Gas Pipeline Company |
| FERC | Federal Energy Regulatory Commission |
| GHG | Greenhouse gas |
| IARC | International Agency for Research on Cancer |
| ICD-10 | International Classification of Disease, 10 th edition |
| Lbs. | pounds |
| ng | natural gas |
| nec | not elsewhere classified |
| ngfsct | natural gas fired stationary compressor turbine |
| NSPSs | New Source Performance Standards |
| NYS | New York State |
| src | source |

Chapter 1. Background

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1. Introduction

1.1. Pollution as a Cause of Human Disease

The causes of human disease are various and complex. The siting of industrial facilities is inherently problematic and political. Communities facing the prospect of a new natural gas compressor station or the expansion of an existing station, must grapple with both sets of concerns and, more difficult still, the specific question of how compressor station emissions may potentially harm human health.

It was only in relatively recent years that a large part of the scientific community accepted the view that environmental and occupational exposures to man-made chemicals and radiation are a significant threat to health. The creation of the U.S. Environmental Protection Agency (EPA) and the U.S. Occupational Agency (OSHA) in 1970 and the passage of the National Cancer Act the next year were each **partly** motivated by growing evidence of pollution as a cause of human diseases.

In the near half-century since these agencies and programs were created, significant progress has been made in reducing pollution in the U.S. But when the actual history is studied, it is clear that these advances only came because of sustained political efforts by people outside of government attempting to pressure those in government to do the right thing over the opposition of vested economic interests. Legislative measures are generally only taken many years after scientific warnings are first raised. And more often than not, these long overdue legislative measures are half-steps that are inadequately funded and ineffectively enforced.

While the positive steps that have been made should be recognized, the difference between what society needed to do to confront the problem of pollution and what has actually been done, is stark.

The two leading causes of death in the U.S. are cardiovascular disease and cancer. Environmental and occupational exposure to chemicals are a significant risk factor for both diseases. Based on data reported by the natural gas industry, this report shows that 18 compressor stations operating in New York State released a total of more than 40 million pounds of toxic air pollution in the period from 2008 to 2014, including 16.3 million pounds association with cardiovascular disease and 9.5 million pounds of carcinogens.

We are approaching the 50th anniversary of the creation of EPA and OSHA and President Nixon's declaration of "The War on Cancer". In 50 years the nation has made little progress in protecting the public from environmental exposures to known and suspected human carcinogens. Perhaps most importantly, this includes the failure of the existing approach to identifying and communicating environmental and occupational chemical risk.

1.2. President's Cancer Panel (2010)

The long-recognized failure of federal agencies to address the environmental causes of cancer led to the creation of the President's Cancer Panel (PCP) which between September 2008 and January 2009 convened four national meetings "to assess the state of environmental cancer research, policy and programs addressing known and potential effects of environmental exposure on cancer." More specifically, the Panel's assigned task was to appraise the National Cancer Program as established in accordance with the National Cancer Act of 1971 (P.L. 92-218), the Health Research Extension Act of 1987 (P.L. 99-158), the National Institutes of Health Revitalization Act of 1993 (P.L. 103-43), and Title V, Part A, Public Health Service Act (42 U.S.C. 281 et seq.). The Panel's overarching conclusion:

Research on environmental causes of cancer has been limited by low priority and inadequate funding. . . There is a lack of emphasis on environmental research as a route to primary cancer prevention. . . Cancer prevention efforts have focused narrowly on smoking, other lifestyle behaviors and chemo-preventive interventions. Scientific evidence on individual and multiple environmental exposure effects on disease initiation and outcomes, and consequent health system and societal costs, are not being adequately integrated into national policy decisions and strategies for disease prevention, health care access and health system reform. (U.S. DHHS 2010)

With regard to this paper's primary concern, identifying the potential health risk associated with routine operations of natural gas compressor stations, four of the Panels critical conclusions are particularly relevant:

1. The Present Approach to Risk Assessment is Inadequate:

[Exposure assessment] is needed more broadly to evaluate cancer risk associated with workplace or environmental exposures in the aggregate. In the U.S., most available exposure assessments are badly outdated. A comprehensive assessment of the extent of all environmental and workplace exposures, for example, has not been conducted since the flawed Doll and Peto estimates published in 1981 (Doll and Peto 1981). Although OSHA's mission is to ensure that workplace environments are safe, it does not conduct a comprehensive national review of carcinogens in the workplace. (U.S. DHHS 2010, p. 15)

Cancer risk assessment also is hampered by lack of access to existing exposure data, especially for occupational/industrial exposures, and regarding levels of radon, asbestos, and other contaminants in schools and day care centers. (U.S. DHHS 2010, p. viii)

Research Methodology and Data Collection Issues: In addition to measurement and standard-setting issues, environmental and occupational cancer research and assessment have suffered from methodologic and data collection weaknesses. (U.S. DHHS 2010, p. 10)

Testimony, Paul Schulte, NIOSH: Right now, the numbers for how many workers are exposed to most of the known carcinogens are 20 to 30 years old so we don't really know what the contemporary workforce is experiencing in terms of exposure.

Testimony, Sandra Steingraber, Ithaca College: Estimates of "attributable fractions" of the cancer burden due to occupation (approximately 4 percent), pollution (2 percent), industrial products (<1 percent), and medicines and medical procedures

(1 percent) are now believed to underestimate significantly the true toll of cancer related to these exposures.” (U.S. DHHS 2010, p. 2)

Recommendation: A thorough new assessment of workplace chemical and other exposures is needed to quantify current health risks. Previous estimates of occupational cancer risk are outdated and should no longer be used by government or industry. (xii)

Recommendation: Measurement tool development and exposure assessment research, including the development of new research models and endpoints, should be accelerated to enable better quantification of exposures at individual, occupational, and population levels. (U.S. DHHS 2010, p. xiv)

Recommendation: Epidemiologic and hazard assessment research must be continued and strengthened in areas in which the evidence is unclear, especially research on workplace exposures, the impact of in utero and childhood exposures, and exposures that appear to have multigenerational effects. Current funding for federally supported occupational and environmental epidemiologic cancer research is inadequate. (U.S. DHHS 2010, p. 105)

2. Workers, Other Populations with Known Exposures, and the General Public Require Full Disclosure of knowledge about Environmental Cancer Risks

Individuals and communities are not being provided all available information about environmental exposures they have experienced, the cumulative effects of such exposures, and how to minimize harmful exposures. (U.S. DHHS 2010, p. ix)

Continued Epidemiologic and Other Environmental Cancer Research Is Needed: Cancer risk assessment . . . is hampered by lack of access to existing exposure data, especially for occupational/industrial exposures, and regarding levels of radon, asbestos, and other contaminants in schools and day care centers. (U.S. DHHS 2010, p. 98)

3. Medical Professionals Need to Consider Occupational and Environmental Factors When Diagnosing Patient Illness

Physicians and other medical professionals rarely ask patients about their workplace and home environments when taking a medical history. Such information can be invaluable in discovering underlying causes of disease. Moreover, gathering this information would contribute substantially to the body of knowledge on environmental cancer risk. (U.S. DHHS 2010, p. ix)

4. Inadequate Funding

Testimony: Elizabeth Fontham, Louisiana State University: Unfortunately, while budgets have waxed and waned on the federal level, a consistent finding, I would say, is that occupational and environmental exposures have been under addressed. (U.S. DHHS 2010, p. 5)

NIOSH Work Group: In 1996, NIOSH convened a group of experts from academia, business, labor, and government to identify the gaps in occupational cancer research methods.⁶⁰ The group’s recommendations for strengthening research methods, which became part of NIOSH’s National Occupational Research Agenda, focused on four broad areas: identification of occupational carcinogens, design of

epidemiologic studies, risk assessment, and primary and secondary prevention (U.S. DHHS 2010, p. 10)

For those who believe that environmental factors are a much-neglected risk factor for cancer (as well as for non-neoplastic diseases) PCP's conclusion is an important step in the right direction. (Everything the Panel has stated about the lack of attention to environmental and occupational causes of cancer could, in our opinion, also be said of non-neoplastic diseases.)

It is, we think, remarkable that those advancing the view that environmental exposures play only the smallest role in human cancer do so without ever discussing let alone conducting a detailed assessment of exposure, i.e., the extent to which Americans are exposed to chemical and radiologic carcinogens.

The starting place of scientific inquiry is identifying all possible factors which might in some measure affect the phenomenon under investigation. How is it possible to conclude that environmental causes are bit players without first having examined fundamental questions related to the extent and significance of exposures to man-made carcinogens? Such questions include: the total pounds of chemicals manufactured and imported, their number and characteristics, the number of chemicals approved for commercial use, the number and volume of chemicals produced by combustion (not intentionally manufactured), where and how exposures occur, their persistence in the environment, chemical synergism, issues related to exposure assessment, and the number of carcinogens found in human urine, blood and adipose tissue as well as evidence of neo-natal contamination?

Any summary account attempting to answer the question (however tentatively) "What causes cancer?" must include an analysis of these critical issues as well as a number of pertinent methodological concerns. Absent this framework any analysis which purports to claim that X% of Y cancers are caused by Z (or some combination of factors) is logically unsound—all of the possible relevant explanations have not been considered.

In this paper, we show that 18 of the state's ~40 natural gas compressor stations released an estimated 40.2 million pounds of toxic into the air over a 7-year period—an annual average of about 5.7 million pounds. The 7-year total included an estimated 9.5 million pounds of carcinogens (80% of which are classified as "known human carcinogens")—approximately 1.4 million pounds a year. The significance of this finding we believe, speaks for itself. Would a reasonable person who is presented with fact persist in the assertion that environmental factors are only a small causal factor? We don't think so.

Our establishing the extent of carcinogenic exposures in a single facility does not prove that they cause a specific percentage of a given cancer or all cancers at this work site, but it does demonstrate that an analysis consistent with the principles, methods and logic of scientific inquiry must seriously take environmental considerations into account.

In *Discourse on Method* Descartes advises that "when it is not in our power to determine what is true, we ought to follow what is most probable." It is this precept that has been the hallmark of modern science. It is, however, one which cannot be said to guide the nation's approach to preventing cancer. The tired assertion endlessly repeated that most cancers have little or no connection to environmental pollution is made without context or reference to physical realities--the extent and characteristics of chemical contamination and its documented effects. The environmental hypothesis is in no meaningful way refuted. It is simply dismissed. ***The physical reality of widespread, unavoidable chemical contamination is the large picture that must frame any meaningful discussion of cancer's etiology as well as risk assessment.***

DRAFT

1.3. Outdoor Air and Particulate Air Pollution: Known Human Carcinogens

What is that larger picture?

In 2013, the International Association for Research on Cancer, the specialized cancer agency of the World Health Organization, classified outdoor air as a known human carcinogen and a leading cause of cancer deaths.

IARC's study was "based on the independent review of more than 1,000 scientific papers from studies on five continents. The reviewed studies analyze the carcinogenicity of various pollutants present in outdoor air pollution, especially particulate matter and transportation-related pollution. The evaluation is driven by findings from large epidemiologic studies that included millions of people living in Europe, North and South America, and Asia."

After reviewing the extensive scientific literature IARC concluded that there is sufficient evidence to conclude that exposure to outdoor air pollution is a cause of lung cancer (Group 1) and that there is a positive association with an increased risk of bladder cancer.

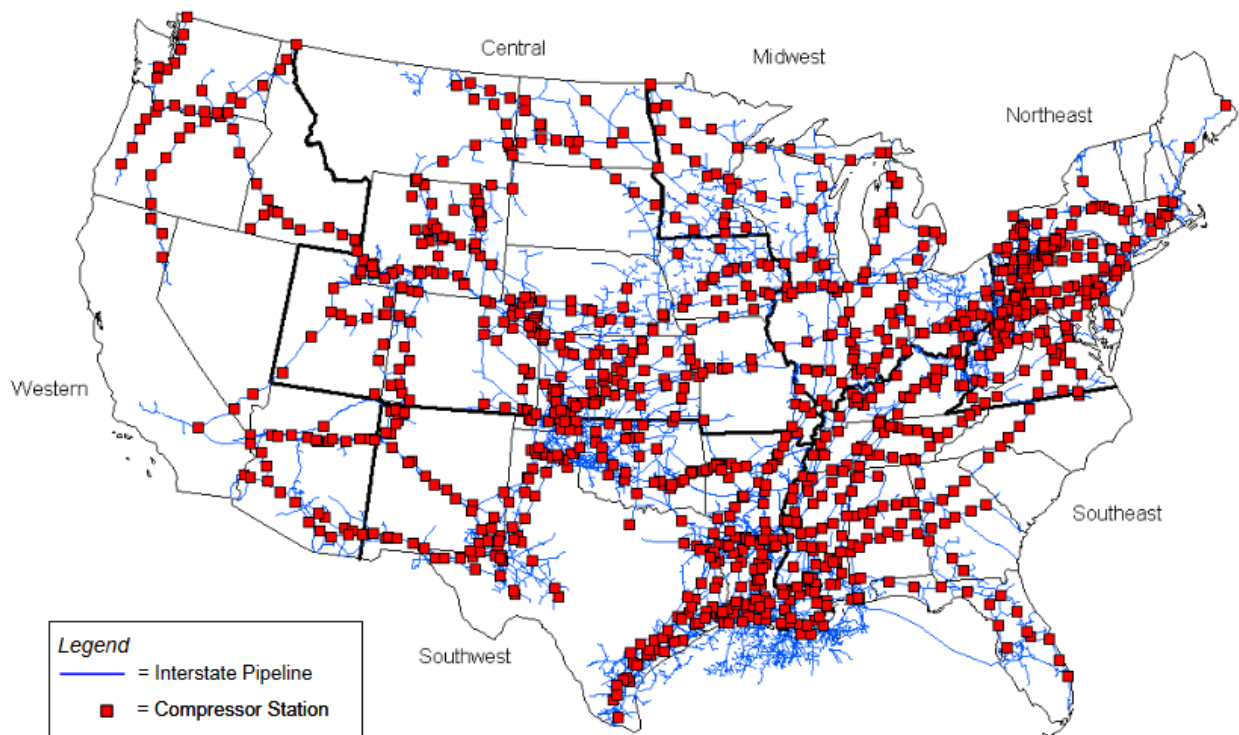
From 2008 to 2014, NYS's natural gas compressor stations released an estimated 2.9 million pounds of particulate pollution, a major component of outdoor air pollution. Particulate airborne pollution was evaluated separately by IARC and was also classified as carcinogenic to humans (Group 1).

The IARC evaluation showed an increasing risk of lung cancer with increasing levels of exposure to particulate matter and air pollution. Although the composition of air pollution and levels of exposure can vary dramatically between locations, the conclusions of the Working Group apply to all regions of the world.

1.4. Expansion of Fracking Operations and Natural Gas Compressor Stations in the U.S.

In 2010, the U.S. Department of Energy reported there were 510,000 operational natural gas wells in the U.S., almost twice as many as there were in 2000, and that on average 13,00 new wells drilled each year during this 10-year period.

To keep pace with the unprecedented expansion of fracking operations, over the last two years the number of natural gas pipeline compressor stations has grown significantly. In 1996, there were approximately 1,047 compressor stations attached to the mainline grid with an installed horsepower of 13.4 million, capable of a daily combined throughput of 743 billion cubic feet. Ten years later there were 1,201 comparable stations (an increase of 17%) with 16.9 million installed horsepower capable of 881 billion cubic feet or a 19% increase in output. (EIA 2007-11)



Note: EIA has determined that publication of this figure does not raise security concerns, based on the application of Federal Geographic Data Committee's *Guidelines for Providing Appropriate Access to Geospatial Data in Response to Security Concerns*.
Source: Energy Information Administration, Natural Gas Division, Natural Gas Transportation Information System, Compressor Station Database.

1.5. The Legal Framework for Accessing the Health and Environmental Risks of Natural Gas Compressor Stations

1.5.1. The Halliburton Loophole

The expansion of unconventional gas operations in the U.S. has largely occurred without benefit of the nominal health and environmental safeguards governing the siting and operation of oil and gas operations in force prior to 2004.

Under the terms of the Energy Policy Act of 2005, oil and gas operations were exempted from almost all existing federal air and water regulations.

The provision in the Act that exempts the oil and gas operations from federal rules covering all other industrial operations is the result of then Vice President Dick Cheney's Energy Task Force and is universally known as the "Halliburton loophole".

Halliburton Corporation is one of the three largest manufacturers of fracking fluids, making it one of the largest beneficiaries of the Act's disregard for even minimal health and safety concerns. Before becoming Vice President in 2001, Cheney was Halliburton's CEO.

In 1997 EPA was ordered to regulate hydraulic fracturing under the Safe Drinking Water Act (SDWA) by the U.S. Court of Appeals for the 11th Circuit (Atlanta), following the contamination of residential drinking water wells in Alabama. The Halliburton Loophole prohibits EPA from regulating the injection of fracturing fluids under the SDWA. In consequence, fracking wastewater is injected directly into or adjacent to underground drinking water without governmental oversight.

In response EPA undertook a 3-year study of the issue. Oil and gas industry representatives made up 5 of the 7 members of EPA's peer review panel, including a representative from Halliburton. The panel's findings, published in 2004, concluded that fracturing "poses little or no threat" to drinking water and that no further study of the question was necessary.

In its investigation, the transparently self-serving panel had ignored or concealed well documented evidence that fracking presents a significant threat to drinking water. Courageously, Weston Wilson, a 30-year veteran of the EPA in Denver, blew the whistle on the panel's violation of scientific principles and available evidence and the Agency's refusal to regulate what is clearly a hazard to public health. The weight of evidence in Wilson's charge that the panel's findings were "scientifically unsound" and the public outcry that followed, forced EPA inspector General Nikki Tinsley to conclude in March 2005 that there was sufficient evidence to justify a review of the panel's work.

It is at this point in the story that Cheney and his former employer Halliburton jumped into the breach--the passage of the Energy Policy Act effectively removed EPA from a meaningful regulation of fracking and related operations, not only of drinking water but also the terms of the Clean Water Act (CWA), the Clean Air Act, the Superfund Act, the Emergency Planning and Community Right-to-Know Act, and the National Environmental Policy Act.

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1.5.2. Public Concerns about the Health Risks of Natural Gas Compressor Stations

The explosion in unregulated fracking operations made possible by the Halliburton Loophole has in turn resulted, as previously noted, in the expansion of natural gas compressor station operations and the constructions of thousands of miles of new pipelines.

As many knowledgeable observers have noted, existing federal, state and local policies that govern industrial site approval and the actual approval process fail adequately to protect the immediate and long-term health of the public or safeguarding the environment.

Many reasons account for this failure.

First and foremost is the view that development (“job creation”) is the paramount concern of government.

Policies certainly exist on paper stating that assessments of potential harm to public health and the environment are an integral part of the approval process.

In actual practice, these “safeguards” are largely a legal formality at great variance from governmental assurances that the primary concern is the public’s health and safety.

Only a small percentage of these proposals are rejected on grounds that they would unduly threaten public health and the environment; in most of these cases it is only because public interest groups could mount and sustain long legal and political struggles.

In the case of struggles attempting to prevent the construction of new or expansion of existing natural gas compression stations, they are waged without any quantitative assessment of potential immediate and long-term health risks associated with air emissions from these facilities.

When local officials or the public raise concerns about the potential health risks associated with natural gas compressor stations, the answer is always the same: “all required studies have been completed”.

What does this mean?

When an average person hears an “expert’s” confidently assertion that “all required studies have been completed”, they conclude this should be taken to mean it won’t cause immediate- or long-term damage to human health or the environment.

That, of course, is precisely the intention.

And to be truthful, this is what many people want to hear; they welcome such an assurance because it means the proposed plant is something they don’t have to worry about or spend time and effort organizing against.

The purpose of the assertion “all required studies have been completed” is to quell public doubt and to silence scientific criticism.

The most important thing the public and local officials need to understand is that “all required studies have been completed” is not the same thing as saying (or the reality) that there is no potential for increased risk of death or disease.”

This is to say, the “required studies” do not, in our opinion, meaningfully protect human health.

The public works under the false assumption that the primary purpose of governmental regulations such as those under consideration is to determine what’s “safe”.

At best, such safeguards prevent egregious potential for harm, but often they don’t even do that.

There are several reasons for this.

The first is that preventing the public from any increased health risk is not the overriding goal of federal and state regulations. Rather, it is “balancing” potential harm from potential “benefits”.

This raises three obvious questions:

Who determines “the potential for harm”?

Who determines what constitutes a “benefit”?

And who determines what the balance between the two should be?

To state the obvious, it is not within the authority of the public, public health experts or independent scientific agencies to answer these questions.

The rules such as they are, have largely been written to advance the interests of industry even when public health and the environment are compromised. The case of the Halliburton Loophole is one obvious example. The refusal to take measures to address climate change is another.

Each of the 18 compressor stations analyzed in this report were required to complete 6 or more federal or state studies before they were given building permits. A few of these studies directly address health concerns, and in each case, they concluded that the proposed facility would meet governmental public health standards.

Let’s throw a few balls up in the air and try to juggle them.

First ball: As previously indicated, IARC has concluded that breathing outdoor air increases everyone’s risk of cancer, meaning that each and every minute of our lives we’re breathing a cocktail of chemical carcinogens.

Second ball: For more than 30 years EPA has maintained that any exposure to a known human carcinogen increases cancer risk.

Third ball: Based on data collected by the natural gas industry and reported by EPA, the 40.2 million pounds of pollution released by the state’s compressor in a 7-year period included 9.5 million pounds of carcinogens (83% of which were classified as “known human carcinogens” by one or more authoritative agency).

Fourth ball: All 18 compressor stations in NYS met all regulatory requirements and were granted building permits.

If the air we breathe is already filled with hundreds of known human carcinogens, any exposure to a single carcinogen increases the risk of developing cancer and

compressor stations add 5.7 million pounds of carcinogens to the state's air every year, how can compressor stations not increase the risk of cancer?

And is the assertion that “all required studies” fully protects public health in any meaningful sense plausible?

Anyone looking for an insight into the growing disillusionment of ordinary citizens with the regulatory process should attempt this logical juggling act.

Engineers and Industry Spokesmen Public Relations Posing as Public Health Experts

It also needs to be understood that the industry spokesman and DEC officials attempting to assure the public that compressor stations pose no threat to human health, are almost without exception people who have no training in public health, epidemiology or toxicology.

In the case of industry representatives, they are public relations specialists or company spokesman who have memorized their lines.

And in the case of the DEC, they are well-qualified scientifically trained engineers with different areas of expertise, but this is not equivalent to being a scientifically trained medical or public health expert.

The NYS DOH

It must also be recognized that historically DOH is reluctant to weigh in on such matters, preferring to let DEC carry the load.

In this connection, it's worth noting that we could locate no systematic analysis of compressor station pollution authored by the DOH.

The public only hears what engineers and public relations officials have to say on the health effects of compressor stations and natural gas pipelines (“all required studies have been completed”) and little or nothing from the agency specifically tasked with protecting public health.

1.6. The Precautionary Principle and Legal Damage Awards

In most cases legislative action to protect the public from the danger of chemical exposures generally only occurs long after harm has been done. This highlights the weakness of the existing approach to chemical regulation—if regulations were adequate there would not be so many effected populations.

Rather than waiting for harm to occur, progressive public health advocates believe regulation should be based on the precautionary principle --concept that when there is some evidence for harm from a particular exposure, but the level of evidence falls short of being clearly established, steps should none-the-less be taken immediately to reduce exposure. Study of hazards from environmental exposures often take many years for definitive results to be obtained, and if one waits to take action until you can count the bodies you will have unnecessarily harmed people. Furthermore, the latency for many diseases is long, and therefore if you take no steps to reduce exposure once the evidence becomes totally clear there will be people who have been unnecessarily exposure who will be developing diseases for many years to come.

Finally, in legal cases it is common for juries to award damages based on proof of exposure to a substance known to cause a disease such as cancer, even if that person does not have cancer him or herself. The level of proof of exposure is usually that the body burden of a substance, for example PCBs or dioxins, is significantly higher than most Americans (usually somewhere between the 75-95th percentile from NHANES). Therefore, courts accept the concept that exposure to a chemical that causes a known disease proves elevated risk of the disease even if the disease has not yet occurred.

1.2. The Existing Literature

1.2.1. Peer-reviewed studies of natural gas compressor stations

To the author's knowledge, there are no peer-reviewed papers examining the health effects associated with pollutants generated by natural gas compressor stations.

PubMed (pubmed.gov), a free resource developed and maintained by the National Center for Biotechnology Information (NCBI) at the National Library of Medicine® (NLM), provided access to more than 27 million citations for biomedical and life science research. The search terms "compressor station" and "natural gas compressor" only generate 28 citations. Only 9 of the 28 have as the primary subject matter compressor stations. In the others, compressor stations are essentially a passing reference.

None provide a quantitative assessment of the volume of compressor station emissions, chemical content of these emissions or their potential health impacts.

| Subject | Author |
|--|--|
| Compressor Stations: major subject of the paper | |
| Compressor stations, criteria pollutants | Goetz et al. 2015 |
| Compressor stations, methane emissions | Jakober et al. 2014, Litto et al. 2012, Mayfield et al. 2017, Nathan et al. 2015, Subramanian et al. 2015 |
| Compressor stations, ocular melanoma associated w\electric motor frequency | Milham and Stetzer 2017. |
| Compressor stations, operations, pipeline energy optimization | Liu et al. 2014 |
| Compressor stations, operations, turbine improvement | Mohamed et al. 2016 |
| Compressor stations, triaryl phosphate poisoning in cattle. | Beck et al. 2012 |
| Compressor stations, vent operations | García et al. 2012 |
| Compressor stations, wildlife impacts from noise | Bunkley, et al. 2017 |
| Fracking operations, animal health | Bamberger and Oswald 2014 |
| Compressor Stations: passing reference | |
| Fracking operations, chemical pollution | Brown et al. 2015, Hildenbrand et al. 2016, Pekney et al. 2014, Lan et al. 2015, Lavoie et al. 2015, Chepenko et al. 2012) |
| Fracking operations, radon | Chepenko et al. 2012 |
| Gas processing, ozone formation | Olague 2012 |
| Health impacts, noise | Boyle et al. 2016 |
| Methane emissions, plume characteristics | Payne et al. 2016 |
| Natural gas operations, beef cattle reproduction and calf mortality | Waldner et al. 2012 |
| Natural gas operations, CAP | Roy et al. 2014 |
| Natural gas operations, methane emissions | Allen et al. 2014 |
| Natural gas operations, methane emissions | Yacovitch et al. 2015 |
| Natural gas operations, methane emissions | Zimmerle et al. |
| Natural gas operations, VOC emissions | Zielinska et al. 2015 |

1.2.2. NYS DEC

The author could locate no specific statement reviewing the volume of releases of emissions from compressor stations, their content or the impact of these chemicals on human health on DEC's website.

1.2.3. NYS DOH

In December 2014, NYS DOH published *A Public Health Review of High Volume Hydraulic Fracturing for Shale Gas Development* (NYSDOH 2014). The report provides a useful summary of peer-reviewed studies of the health impacts of unconventional gas development including compressor stations. To be precise, it contains 5 references to "compressor stations". But nowhere in this 186-page report is there a reference to the volume of emissions from compressor stations, their content or the impact of these chemicals on human health.

1.2.4. National Academy of Science's Health Impact Assessment of Shale Gas Extraction

In 2014 the National Academy of Science published *Health Impact Assessment of Shale Gas Extraction: Workshop Summary* (NYAS 2014). The report contains a great deal of important information about the pollution associated with fracking but almost nothing concerning the pollution associated with the transportation of natural gas.

The phrase "compressor station" appears 13 times. None of these references provide any quantitative assessment of compressor station emissions.

But the last reference to compressor stations which appears in the report's final paragraph does say something quite important.

Finally, the panel was asked to comment on the testing of acute, short-term exposures versus low-level chronic exposures, for example, the low-level chronic exposures of farmers who leased out their land for hydraulic fracturing or homeowners who are living 100 feet from a compressor station and live with these emissions daily. The audience member noted that there has been remarkably little air and water testing in the U.S. gas fields to date, and the available testing efforts have shown exposures at "safe" levels, which is disheartening for people experiencing a multiplicity of health symptoms at these levels. . .

1.2.5. U.S. Environmental Protection Agency, Inspector General

A 2013 report from the United States Environmental Protection Agency 's Inspector General states that there is inadequate information available on direct measurement emissions from oil and gas production activities.

High levels of growth in the oil and natural gas (gas) production sector, coupled with harmful pollutants emitted, have underscored the need for EPA to gain a better understanding of emissions and potential risks from the production of oil and gas. However, EPA has limited directly-measured air emissions data for air toxics and criteria pollutants for several important oil and gas production processes and sources, including well completions and evaporative ponds. Also, EPA does not have a comprehensive strategy for improving air emissions data for the oil and gas production sector; the Agency did not anticipate the tremendous growth of the sector, and previously only allocated limited resources to the issue. (USEPA 2013)

1.2.6. U.S. Agency for Toxic Substances and Disease Registry

A 2016 report by the U.S. Agency for Toxic Substances and Disease Registry (ATSDR) of health particulate matter exposures in the vicinity of the Williams Central natural gas compressor station in Brooklyn Township, Susquehanna County, Pennsylvania, reached 2 fundamental conclusions:

Conclusion 1, Short term exposures: Exposure to maximum levels of PM_{2.5} may be harmful to unusually sensitive populations, such as those with respiratory or heart disease, but are not at levels that are a concern to the general population.

Conclusion 2, Chronic exposures: The estimated annual average PM_{2.5} concentration of 15 to 16 µg/m³ may be harmful to the general population and sensitive subpopulations, including the elderly, children, and those with respiratory or heart disease.

(USATSDR 2016)

1.3. Requests for Information

The need for quantitative information about the volume of pollution and its potential to cause adverse health impacts has been the subject of resolutions by local governments, public health advocates as well as local, regional and state environmental organizations.

1.3.1. Letter to Mr. Michael Higgins, NYS DEC, Division of Environmental Permits From the Westchester County Board of Legislators (February 2015)

Board of Legislators Resolution No. 80-2014 Resolution No. 80-2014 (“Resolution”) calls for independent, transparent, continuous and comprehensive baseline air testing to establish the public’s exposure to toxins that are currently being emitted from the compressor stations prior to allowing any increase in emissions. Furthermore, the resolution calls upon all involved agencies, including NYSDEC, to evaluate cumulative short and long-term health impacts of the entire proposed AIM project, including the impact of emissions from all regional sources of emissions, prior to any expansion of these compressor stations. (Westchester 2015)

1.3.2. Letters to Governor Cuomo and Health Commissioner Howard A. Zucker From Concerned Health Professionals of New York, Physicians for Social Responsibility -- U.S., Physicians for Social Responsibility -- New York (October 14, 2015, May 29, 2014, February 27, 2013, October 4, 2012, March 16, 2012, December 12, 2011, October 5, 2011, March 26, 2011, February 28, 2011)

Compressor stations and pipelines are both major sources of air pollutants, including benzene and formaldehyde, that create serious health risks for those living nearby while offering little or no offsetting economic benefits. Compressor stations – used along regular intervals of most pipelines – in particular, are semi-permanent facilities that pollute the air 24 hours a day and expose nearby residents to levels of noise pollution known to induce negative health effects. Moreover, emerging data show that their day-to-day air emissions are highly episodic and create periods of potentially extreme exposures.

We have particular concerns about the air pollution events created by compressor station “blowdown” events, which are used for maintenance and to control pressure and can last for hours. The intentional or accidental releases of gas through valves create 30- to 60-meter-high gas plumes, causing high levels of contaminant release. Anecdotal accounts associate blowdowns with short term effects such as nosebleeds, burning eyes and throat, skin irritation, and headache. Given the chemicals released, we are deeply concerned about the possible long-term effects of these exposures, including cancer, asthma, heart disease and severe neurological impairments. We note that there exists neither a national nor a state inventory of compressor station accidents. We have yet to accumulate an extensive body of peer-reviewed research on the public health impacts of compressor stations, but our new report includes very troubling documentation of extensive leakage of methane and other contaminants. (CHPNY)

1.3.3. Letter to Mr. Christopher Hogan, NYSDEC, Division of Environmental Permits
From 14 NYS Physicians (September 12, 2016)

We are . . . greatly concerned that no state agency appears to be monitoring the ever increasing flow of information and scientific studies based on effects of UNGD and its associated infrastructure. On this point we would like to be mistaken; and please correct us if we are. But since the two-year Public Health Review of HVHF activities concluded in December 2014, it appears that DEC and DOH have “washed their hands” of the issue. Nevertheless, huge problems - with health impacts, quality of life and climate impacts associated with the proliferation of natural gas infrastructure in our state - are not going away. Someone needs to be paying attention to this, and “connecting the dots” - individual infrastructure projects must be considered not only separately but in their cumulative health, environmental, and climate impacts. We do not see this happening in New York State. (Medical Professionals 2016)

1.3.4. Public Statement: Mothers Out Front Mobilizing for a Livable Climate
(Monroe County NY)

It is somewhat difficult to find scientific literature completely focused on the impacts of compressor stations. . . (MOF)

1.4. Summary

Based on data submitted by the natural gas industry and collected by DEC and EPA we show that 18 compressor stations in NYS were responsible for releasing more than 40 million pounds of toxic air pollutants over a 7-year period, including:

- 9.5 million pounds of human carcinogens,
- 18.8 million pounds of chemicals associated with blood and immune system disorders,
- 18.8 million pounds associated with endocrine, nutritional and metabolic disorders,
- 18.7 million pounds of chemicals with mental and behavioral effects,
- 18.7 million pounds that affect the brain and central nervous system,
- 24.7 million pounds that affect the eye and adnexa,
- 17.5 million pounds that affect the ear and mastoid process,
- 16.3 million pounds associated with circulatory system diseases including heart attacks and strokes,
- 39.6 million pounds linked to respiratory system diseases,
- 38.5 million pounds linked to digestive system diseases,
- 27.7 million pounds associated with skin and subcutaneous tissue disorders,
- 1.2 million pounds linked to musculoskeletal system and connective tissue diseases,
- 39.9 million pounds with genitourinary system diseases,
- 6.4 million pounds with urinary system diseases and disorders,
- 39.9 million pounds connected to pelvis, genital and breast diseases including reproductive disorders
- 19.6 million pounds that affect pregnancy, childbirth and the puerperium,
- 22.5 million pounds with certain conditions originating in the perinatal period,
- 39.6 million pounds with congenital malformations, deformations, chromosomal abnormalities, and
- 39.6 million pounds with symptoms, signs and abnormal clinical and laboratory findings, nec.

What should the public make of this?

- 1.4.1. A substantial amount of health relevant information is not reaching the public
- A tenant of health and community governance is public information and health and safety. Community members depend on Public Officials to provide information needed to protect their health. In the case of gas compressor stations substantive amounts of health relevant information is not reaching the public. Instead of informing the public, the information is mired in bureaucratic processes.

1.4.2. Governments' failure to analyze or communicate the results of its own data collection

The data analyzed in this report is collected by DEC and EPA. Neither agency has reported the total volume of pollution associated with the transportation of national gas, let alone analyzed these releases in terms of how they potentially impact human health.

It is the responsibility of each compressor station in NYS to estimate the total volume of pollution they generate as well as its chemical constituents and to report this information to DEC--and they do.

DEC is required to review this information and forward it to EPA--and they do.

EPA assembles this data and make it available to the public, which they do, not just for compressor station but for millions of other sites nationally.

It is not the most difficult thing in the world to use the information collected and apply a little math. But, if either the EPA or DEC have ever done so, it is not something to our knowledge that has been presented to the public. Nor have we found this information on their respective web sites.

The information that is collected is presented in formats that are not readily understood by local residents. To be useful, the most important conclusions and insights of technical data must be comprehensible to the average person.

1.4.3. DOH's failure to analyze the potential health impacts of compressor station pollution

For its part, even if EPA and DEC are interested in analyzing the compressor station emission data they collect, there is nothing to prevent DOH from doing so.

DEC\EPAs' compressor station data is publicly available. DOH could download it and do the math.

Again, as far as this author is aware, DOH has not done so.

1.4.4. Industry and governmental assurances that gas compressor stations “comply with all air quality requirements” and that they therefore pose no unreasonable threat to public health

Each of the 56 compressor stations that have been permitted by DEC have been approved based on the conclusion that they comply with all federal and state air quality requirements.

When members of the public or local officials question the potential health effects of compressor station pollution, the response from industry, EPA, DEC and DOH is always that “all legal requirements have been met” -- the clear implication being that if these “legal requirements” have been met, there is no reason to be concerned about adverse health effects.

For example, in a public statement issue by Dominion Transmission concerning its New Market Project, it states: “The FERC approved New Market on April 28, 2016 after 23 months of evaluating all environmental, health and safety concerns associated with the project.”

Dominion poses the question, “What will be the environmental and public health concerns?” Its answer:

Any emissions from the compressor station will comply with all air quality requirements, which are established to protect the public health, safety and welfare. We would not operate the compressor station if we could not operate it according to stringent air quality regulations.

Ensuring compliance with environmental requirements fall either to the Environmental Protection Agency (EPA) or state environmental agencies (states by delegation), depending on the specific permit and rule. (Dominion 2016)

Dominion is disingenuous. Their health and safety officials recognize, or should recognize, that Federal and State Environmental laws and regulations are designed to protect the general health of regional populations and not to protect any single group of locally exposed persons. The “stringent air quality regulations” that Dominion refers to are those established by EPA for the purpose of controlling regional levels of pollution.

Therefore, these regulations make three critical, scientifically questionable assumptions when applied to local pollution.

The “stringent air quality regulations” that Dominion refers to are those established by EPA.

It is beyond the scope of this project to provide a full analysis of this claim, but several brief observations are in order.

First, the regulation used to determine the potential health impacts of chemical exposure make three critical, scientifically questionable assumptions.

1. Individual Chemicals versus Chemical Mixtures

First, it effectively assumes that an air standard can be set for a single chemical to protect against unnecessary risk. The problem here is that setting standards for individual chemicals makes very little sense when people are continuously exposed to multiple complex chemical mixtures.

The mixture of any two chemicals can be additive ($1 + 1 = 2$), less than additive ($1 + 1 = 1.5$), or synergistic ($1 + 1 = 2+$).

NYS’s national gas compressor stations reported releasing more than 70 chemicals.

This number includes 31 chemicals associated with circulatory diseases like heart attacks and strokes. Knowing how much risk is associated with a single circulatory toxicant tells us nothing about the real-world risk of being exposed to 31.

The state's compressor station reported releasing a total of 59 carcinogens, including 23 chemicals classified as "known human carcinogens" by an authoritative international, federal or state agency. Of the 9.6 million pounds of carcinogens released from 2008 to 2014, 83% were known to cause cancer in humans. The effect of being exposed to multiple carcinogens is not considered in EPA or DEC regulations.

2. Average versus Acute Exposures

EPA and DEC guidelines assume that the exposures from a facility occur evenly over time. In fact, for any given facility air pollution releases fluctuate widely. What this means is that at times of peak exposure individuals may breathe chemical concentrations greater than what is assumed to be safe. Studies have shown that levels of the carcinogens formaldehyde, benzene and 1,3-butadiene periodically exceed what federal and state guidelines consider safe at natural gas compressor stations in four states. (Macey et al. 2014).

3. Healthy versus health-compromised or particularly vulnerable populations

With a few exceptions, EPA and DEC guidelines assume that everyone is at equal risk from the harmful effects of air pollution. This is simply not the case. There are many populations who are at greater risk, including, infants, children, pregnant women, the elderly, those with compromised immune systems, and those already suffering from specific diseases or disorders.

Studies have shown that the cancer rates are proportional to levels of regional air pollution. These three points aside, it is plausible that the release of 9.6 million pounds of carcinogens in a 7-year period, and continued releases over the active use of the facility does increase the incidence of certain types of cancer.

When national economic concerns are given priority higher than community health it is necessary to provide simple and clear guidance to the person whose risk is increased. In those situations, it is not appropriate to compare risks to other sources or situations. Individuals who know that they are of enhanced risks, avoid polluted areas.

The environmental and health risks can be handled much more fairly. To do so requires recognition of commonly understood concepts and readily accessible information.

1.4.5. President's Obama's Cancer Panel

These specific points aside, it's useful to consider the claim that environmental pollution from natural gas compressor stations poses no threat to human health in the context of the findings of the President's Cancer Panel (2010).

Between September 2008 and January 2009, the President's Cancer Panel (PCP) convened four national meetings "to assess the state of environmental cancer research, policy and programs addressing known and potential effects of environmental exposure on cancer."

The Panel's report, released in 2010, came to this essential conclusion:

"Research on environmental causes of cancer has been limited by low priority and inadequate funding. . . There is a lack of emphasis on environmental research as a route to primary cancer prevention. . . Cancer prevention efforts have focused narrowly on smoking, other lifestyle behaviors and chemo-preventive interventions. Scientific evidence on individual and multiple environmental exposure effects on disease initiation and outcomes, and consequent health system and societal costs, are not being adequately integrated into national policy decisions and strategies for disease prevention, health care access and health system reform." (U.S. DHHS 2010)

In the light of Panel's conclusion, the results of our study raise three significant questions:

First, what percentage of cancers is likely a consequence of exposure to chemical carcinogens?

Secondly, what is the impact of occupation as compared to non-occupation exposures?

Finally, how adequate are policies that both inform people of hazards and act to reduce exposure to chemical carcinogens?

There is considerable debate on the question of what percentages of cancers are due to exposure to chemical carcinogens, both in the workplace and elsewhere. Doll and Peto (1981) "provisionally estimated" that 4% of cancer was due to occupational exposures, but attributed most of this to lung cancer. Mokdad et al. (2004) ascribed only 2.3% of causes of death in the US to "toxic agents", but then attributed 18.1% to tobacco and 16.6% to poor diet and physical inactivity, not distinguishing the degree to which either was due to chemicals in tobacco or food. Schottenfeld et al. (2013) list tobacco, alcohol, ionizing radiation, solar radiation, infectious agents and obesity as risk factors for cancer, but totally ignore other chemical carcinogens other than occupational exposures. Prüss-Ustün and colleagues from the World Health Organization (2016) attribute 19% of all cancer to environmental factors, which includes 2-8% due to exposure in occupational exposures. Their report does not consider smoking, alcohol, diet or genetic factors. In discussing specific cancers, they attributed colon and rectal cancer to low physical activity, radiation and asbestos, but do not mention other chemical carcinogens in food. Chemical exposure is identified as a risk factor for breast, lymphoma, multiple myeloma, leukemia, larynx, bladder and melanoma cancers. Clapp et al. (2008) note that while overall cancer rates are declining (especially lung among men and colorectal in both sexes), some are rising (esophagus, liver, thyroid, melanoma, non-Hodgkin's, multiple myeloma, testicular, bladder, brain, and lung in women). Childhood cancers (leukemia and brain) are also rising. They and Belpomme et al. (2007) provide strong evidence that exposure to carcinogenic chemicals plays a major role in risk of these cancers. Christiani (2011) has suggested that 85-95% of cancer arise because of exposure to specific carcinogenic agents.

In addition to exposure to chemical carcinogens, cancer can be caused by genetics, infection and inflammation. Lichtenstein et al. (2000) reported an analysis of mono- and di-zygotic twins in Scandinavia in an effort to distinguish genetic from environmental factors in causation of cancer. They concluded that most cancers were due to environmental factors. Genetic factors were relatively unimportant in most cancers, although were significant in prostate (42%), colorectal (35%) and breast cancer (27%). Wu et al. (2016) examined intrinsic and extrinsic risk factors for cancer, and concluded that intrinsic factors contribute only modestly (less than 10-30%) to the risk. This is not to imply that individual genetic differences are unimportant, because polymorphisms of drug metabolizing enzymes serve as modulators of cancer susceptibility (Taningher et al., 1999).

These reports indicate that we do not have good understanding of the relative role of exposure to chemical carcinogens in overall cancer incidence beyond general knowledge that many chemicals to which humans are exposed cause cancer. Clearly carcinogenic chemicals are found in both the occupational and non-occupational environment. While the chemical exposure in an occupational setting differs from that of the general population, there are many carcinogens found in food, tobacco, personal care products, and indoor and outdoor air. Many use terms such as “life-style” to encompass such behaviors, without considering the carcinogenic chemicals that result from these behaviors. Workers have all of these non-occupational exposures as well as those specific to the workplace.

EPA’s official policy is that exposure to any level of carcinogen increases the risk of cancer. At the same time, EPA has a methodology to determine the extent of risk that rarely finds excessive risk. It is hard to fathom how the release of 9.6 million pounds of carcinogens in a 7-year period does not increase the incidence of cancer.

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Chapter 2. Compressor Station Releases

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2.1. Number, Categorization and Operational Status of Facilities

This report analyzes the emissions data for 18 natural gas compressor stations in New York State (NYS) as reported to the National Emissions Inventory (NEI) of the U.S. Environmental Protection Agency (EPA) as point sources of air pollution for the period 2008 to 2014.

The author could not locate a single list of facilities involved in the storage and transportation of natural NYS from either state or federal sources.

One was created by reviewing all DEC air permits and identifying those that are compressor stations and comparing it to those listed in EPA's Envirofacts System.

This is a little more complicated than it might seem because there are a large number of permits and permit modifications, all compressor stations are not necessarily labeled as such, there are apparent inconsistencies in NAICS and SIC classifications, and some sites have multiple functions.

We identified a total of 65 compressor stations, including operational (55), approved (2), denied (1), and pending (7).

This list provides what the author believes is an accurate characterization of major natural gas facilities in NYS but it should not be considered comprehensive or final. Additional research would undoubtedly identify additional sites, especially minor ones, and clarify the function of several sites.

Table 2.1

| Facility Type | Total |
|---------------------------|-------|
| Compressor stations | 60 |
| Operational | 54 |
| Proposed: Approved | 2 |
| Proposed: Denied approval | 1 |
| Proposed: Pending | 3 |

| | |
|-------------------------------|----|
| Dehydration facility | 1 |
| Gas turbine facility | 4 |
| Gate | 3 |
| Holding point tap | 2 |
| Metering & regulation station | 19 |
| Pig launching or receiving | 1 |
| Storage & filling | 1 |
| Unknown | 2 |

2.2. NYSDEC Air Pollution Control Permits and Registrations

Under the Clean Air Act and under New York State law and regulation, most notably 6 NYCRR Part 201, NYSDEC is required to issue permits for polluters. The two most common permits for large on-site polluters are: “Air Title V Facility permits” and “State facility permits”.

NYSDEC describes these as follows:

2.2.1. State Facility Permits

State facility permits are issued to facilities that are not considered to be major (as defined in the department's regulations), but that meet the criteria of Subpart 201-5. (link leaves DEC) These are generally large facilities with the following characteristics:

- Their actual emissions exceed 50 percent of the level that would make them major, but their potential to emit as defined in 6NYCRR Part 200 does not place them in the major category
- They require the use of permit conditions to limit emissions below thresholds that would make them subject to certain state or federal requirements
- They have been granted variances under the department's air regulations, or
- They are new facilities that are subject to New Source Performance Standards (NSPS) or that emit hazardous air pollutants. Instead, all DEC site.

2.2.2. Title V Permits

Title V facility permits, the second type of permit, are issued to facilities subject to Subpart 201-6. These include facilities that are judged to be major under the department's regulations, or that are subject to New Source Performance Standards (NSPSs), to a standard or other requirements regulating hazardous air pollutants or to federal acid rain program requirements.

Title V permits reduce violations of air pollution laws and improve enforcement of those laws by:

- Recording in one document all of the air pollution control requirements that apply to the source. This gives members of the public, regulators, and the source a clear picture of what the facility is required to do to keep its air pollution under the legal limits.
- Requiring the source to make regular reports on how it is tracking its emissions of pollution and the controls it is using to limit its emissions. These reports are public information, and you can get them from the permitting authority.
- Adding monitoring, testing, or record keeping requirements, where needed to assure that the source complies with its emission limits or other pollution control requirements.
- Requiring the source to certify each year whether or not it has met the air pollution requirements in its title V permit. These certifications are public information.
- Making the terms of the title V permit federally enforceable. This means that EPA and the public can enforce the terms of the permit, along with the State.

(Source: NYSDEC)

The legal intention of a Title V operating air permit is described by DEC as:

The Title V operating air permit is intended to be a document containing only enforceable terms and conditions as well as any additional information, such as the identification of emission units, emission points, emission sources and processes, that makes the terms meaningful. 40 CFR Part 70.7(a)(5) requires that each Title V permit have an accompanying "...statement that sets forth the legal and factual basis for the draft permit conditions". The purpose for this permit review report is to satisfy the above requirement by providing pertinent details regarding the permit/application data and permit conditions in a more easily understandable format. This report will also include background narrative and explanations of regulatory decisions made by the reviewer. It should be emphasized that this permit review report, while based on information contained in the permit, is a separate document and is not itself an enforceable term and condition of the permit.

2.3. Reporting Requirements for Compressor Stations with Title V Permits

Each permitted point-source of pollution must meet one or more state or federal reporting requirements.

The two tables which follow summarize the principal air pollution regulatory programs applicable for each of the 18 NYS compressor stations under review.

Table 2.3.1.

Applicable State and Federal Air Pollution Regulatory Programs by Facility

NYS Natural Gas Compressor Stations

| | | | State and Federal Air Pollution Regulatory Programs | | | | | | | | | |
|----------------------|------------|--------------------|---|-----|--------|------|------|----------|---------|----------|-------|-----|
| Facility | County | Town | PSD | NSR | NESHAP | MACT | NSPS | Title IV | Title V | Title VI | RACCT | SIP |
| Count ("Yes"): | | | 4 | 0 | 0 | 14 | 7 | 0 | 18 | 0 | 18 | 18 |
| AGT Southeast CS | Putnam | Southeast | No | No | No | No | Yes | No | Yes | No | Yes | Yes |
| AGT Stony Point CS | Rockland | Stony Point | Yes | No | No | Yes | Yes | No | Yes | No | Yes | Yes |
| DTI Borger CS | Tompkins | Ithaca | Yes | No | No | No | Yes | No | Yes | No | Yes | Yes |
| DTI Utica Station | Herkimer | Frankfort | Yes | No | No | No | No | No | Yes | No | Yes | Yes |
| DTI Woodhull Station | Steuben | Woodhull | No | No | No | Yes | Yes | No | Yes | No | Yes | Yes |
| NFGSC Beech Hill CS | Allegany | Willing | No | No | No | Yes | No | No | Yes | No | Yes | Yes |
| NFGSC Concord CS | Erie | Concord | No | No | No | Yes | Yes | No | Yes | No | Yes | Yes |
| NFGSC Independ. CS | Allegany | Andover | No | No | No | Yes | No | No | Yes | No | Yes | Yes |
| NFGSC Nashville CS | Chautauqua | Hanover | No | No | No | No | No | No | Yes | No | Yes | Yes |
| TGPC 229 & TEG DF | Erie | Eden | No | No | No | Yes | No | No | Yes | No | Yes | Yes |
| TGPC CS 224 | Chautauqua | Clymer | No | No | No | Yes | No | No | Yes | No | Yes | Yes |
| TGPC CS 230-C | Niagara | Lockport | No | No | No | Yes | No | No | Yes | No | Yes | Yes |
| TGPC CS 233 | Livingston | York | No | No | No | Yes | Yes | No | Yes | No | Yes | Yes |
| TGPC CS 237 | Ontario | Manchester, Phelps | No | No | No | Yes | No | No | Yes | No | Yes | Yes |
| TGPC CS 241 | Onondaga | LaFayette | Yes | No | No | Yes | No | No | Yes | No | Yes | Yes |
| TGPC CS 245 | Herkimer | Winfield | No | No | No | Yes | No | No | Yes | No | Yes | Yes |
| TGPC CS 249 | Schoharie | Carlisle | No | No | No | Yes | No | No | Yes | No | Yes | Yes |
| TGPC CS 254 | Columbia | Chatham | No | No | No | Yes | Yes | No | Yes | No | Yes | Yes |

Source: Author's review of NYS DEC permits.

Table 2.3.2.

Applicable State and Federal Air Pollution Regulatory Programs: Summary

NYS Natural Gas Compressor Stations

| Regulatory Program | Description | No |
|--|--|----|
| Prevention of Significant Deterioration PSD 40 CFR 52 | Prevention of Significant Deterioration (40 CFR 52) - requirements which pertain to major stationary sources located in areas which are in attainment of National Ambient Air Quality Standards (NAAQS) for specified pollutants. | 4 |
| New Source Review NSR 6 NYCRR Part 231 | New Source Review (6 NYCRR Part 231) - requirements which pertain to major stationary sources located in areas which are in non-attainment of National Ambient Air Quality Standards (NAAQS) for specified pollutants. | 0 |
| National Emission Standards for Hazardous Air Pollutants NESHAP 40 CFR 61 | National Emission Standards for Hazardous Air Pollutants (40 CFR 61) - contaminant and source specific emission standards established prior to the Clean Air Act Amendments of 1990 (CAAA) which were developed for 9 air contaminants (inorganic arsenic, radon, benzene, vinyl chloride, asbestos, mercury, beryllium, radionuclides, and volatile HAP's). | 0 |
| Maximum Achievable Control Technology MACT 40 CFR 63 | Maximum Achievable Control Technology (40 CFR 63) - contaminant and source specific emission standards established by the 1990 CAAA. Under Section 112 of the CAAA, the US EPA is required to develop and promulgate emissions standards for new and existing sources. The standards are to be based on the best demonstrated control technology and practices in the regulated industry, otherwise known as MACT. The corresponding regulations apply to specific source types and contaminants. | 14 |
| New Source Performance Standards NSPS 40 CFR 60 | New Source Performance Standards (40 CFR 60) - standards of performance for specific stationary source categories developed by the US EPA under Section 111 of the CAAA. The standards apply only to those stationary sources which have been constructed or modified after the regulations have been proposed by publication in the Federal Register and only to the specific contaminant(s) listed in the regulation. | 7 |
| Title IV Acid Rain Control Program Title IV 40 CFR 72-78 | Title IV Acid Rain Control Program (40 CFR 72 thru 78) - regulations which mandate the implementation of the acid rain control program for large stationary combustion facilities. | 0 |
| Title V | | 18 |
| Title VI Stratospheric Ozone Protection Title VI 40 CFR 82, Subparts A-G | Title VI Stratospheric Ozone Protection (40 CFR 82, Subparts A thru G) - federal requirements that apply to sources which use a minimum quantity of CFC's (chlorofluorocarbons), HCFC's (hydrofluorocarbons) or other ozone depleting substances or regulated substitute substances in equipment such as air conditioners, refrigeration equipment or motor vehicle air conditioners or appliances. | 0 |
| Reasonably Available Control Technology RACCT 6 NYCRR Parts 212.10, 226, 227-2, 228, 229, 230, 232, 233, 234, 235, 236) | Reasonably Available Control Technology (6 NYCRR Parts 212.10, 226, 227-2, 228, 229, 230, 232, 233, 234, 235, 236) - the lowest emission limit that a specific source is capable of meeting by application of control technology that is reasonably available, considering technological and economic feasibility. RACT is a control strategy used to limit emissions of VOC's and NOx for the purpose of attaining the air quality standard for ozone. The term as it is used in the above table refers to those state air pollution control regulations which specifically regulate VOC and NOx emissions. | 18 |
| State Implementation Plan SIP 40 CFR 52, Subpart HH | State Implementation Plan (40 CFR 52, Subpart HH) - as per the CAAA, all states are empowered and required to devise the specific combination of controls that, when implemented, will bring about attainment of ambient air quality standards established by the federal government and the individual state. This specific combination of measures is referred to as the SIP. The term here refers to those state regulations that are approved to be included in the SIP and thus are considered federally enforceable. | 18 |

2.4. U.S. EPA NEI Reporting for Compressor Stations

How a facility is permitted determines how its pollution data is tracked by NEI.

Compressor stations receiving a “Title V” permit are tracked by the system NEI uses for point air pollution sources. Compressor stations receiving a “State Facility Permit” are tracked by the system NEI uses for non-point sources of air pollution.

There is one exception: A single station with a “State Facility Permit” is being tracked as an NEI on-site polluter. It is unclear why this is the case.

2.4.1. Compressor Stations with a “Title V Permit”

The NEI for 2008-2014 includes data for 18 compressor stations in NYS.

There are, however, several additional sites classified as “Title V” facilities on the DEC’s website which are not found in NEI. (We notified DEC of this discrepancy and are in conversation to determine why these sites are not included as NEI point polluters. The compressor sites found in NEI are the exclusive source of data for this report.)

North American Industry Classification System (NAICS) code 48621 is used to designate facilities whose main purpose is the transportation of natural gas. Each of the 18 sites analyzed have this classification.

2.4.2. Compressor Stations with a “State Facility Permit”

We have identified 19 non-Title V compressor stations which, based on federal and state guidelines, should be reported as non-point NEI sources. Because these stations are not easily identified within NEI and the time limits and scope of this project, an analysis of the pollution associated with their operation is not included in this report.

Table 2.4.2.

Facilities Categorization: Transportation of Natural Gas (NAICS 48621)

New York State

| # | Status* | Name | Address | Town | Zip | DEC Reg. | County | NEI Point Src. | GHG |
|---|---------|-------------------------------|----------------------------|--------------------|-------|----------|-------------|----------------|-----|
| 1 | Op-EM | AGT Southeast CS | 142 Tulip Rd | Southeast | 10509 | 3 | Putnam | √ | √ |
| 2 | Op-EM | AGT Stony Point CS | 1 Lindberg Rd | Stony Point | 10980 | 3 | Rockland | √ | √ |
| | Op | CGTC Coming CS | 4401 College Ave | Coming | 14830 | 8 | Steuben | | √ |
| | Op | CGTC Dundee CS | 4620 Rte. 226 | Starkey | 14878 | 8 | Yates | | |
| | Op | CGTC North Greenwood CS | Brown Hollow Rd @ Kelly Rd | Greenwood | 14839 | 8 | Steuben | | |
| | Op | DTI Borger CS | 219 Ellis Hollow Creek Rd | Ithaca | 14850 | 7 | Tompkins | √ | |
| | Op-EM | DTI Brookman CS | 201 Casler Rd | Minden | 13339 | 4 | Montgomery | | |
| | Op | DTI Canajoharie MRS | 110 Gogus Rd | Canajoharie | 12010 | 4 | Montgomery | | |
| | Op-EM | DTI Utica Station | Higby Rd | Frankfort | 13340 | 6 | Herkimer | √ | |
| | Op | DTI Woodhull Station | 974 CO RTE 99 | Woodhull | 14898 | 8 | Steuben | √ | |
| | Op | HSC | 4511 Egypt Rd | Canandaigua | 14424 | 8 | Ontario | | |
| | Op | Hunts Point Ave CS | 332 Hunts Point Avenue | | 10474 | 2 | Bronx | | |
| | Op | IGTS Athens CS | 915 Schoharie Tpk Cr 28 | Athens | 12015 | 4 | Greene | | |
| | Op | IGTS Boonville CS | 3338 East Rd | Boonville | 13309 | 6 | Oneida | | |
| | Op | IGTS Croghan CS | Old State Rd | Croghan | 13327 | 6 | Lewis | | |
| | Op | IGTS Dover CS | 186 Dover Furnace Rd | Dover Plains | 12522 | 3 | Dutchess | | |
| | Op | IGTS Wright CS | 320 Westfall Road | Delanson | 12053 | 4 | Schenectady | | √ |
| | Op | Millennium Minisink CS | 107 Jacobs Rd | Wawayanda | 10998 | 3 | Orange | | √ |
| | Op | NFGSC Beech Hill CS | 1161 Peet Rd | Willing | 14895 | 9 | Allegany | √ | |
| | Op | NFGSC Concord CS | 5510 Genesee Rd | Concord | 14141 | 9 | Erie | √ | √ |
| | Op | NFGSC Independence CS | 2210 County Road 22 | Andover | 14806 | 9 | Allegany | √ | √ |
| | Op | NFGSC Nashville CS | 11413 Allegany Rd | Hanover | 14062 | 9 | Chautauqua | √ | |
| | Op-EM | NFGSC Porterville CS | 350 Hemstreet Rd | Aurora | 14052 | 9 | Erie | | |
| | Op | NFGSC Zoar CS | Wilson & Conerts Rd | Collins | 14034 | 9 | Erie | | |
| | Op | NP Hanover Mayville CS | 5644 Bently Rd | Chautauqua | 14757 | 9 | Chautauqua | | |
| | Op | TE Catlin Hill CS | Brown and Cemetery Rds | Catlin | 14812 | 8 | Chemung | | |
| | Op-EM | TGP CS 230-C | 7586 East Eden Road | Eden | 14057 | 9 | Erie | | |
| | Op | TGPC 229 & TEG DF | 7586 East Eden Road | Eden | 14057 | 9 | Erie | √ | √ |
| | Op | TGPC CS 224 | 9766 Ravlin Hill Rd | Clymer | 14724 | 9 | Chautauqua | √ | √ |
| | Op | TGPC CS 230-C | 5186 Lockport Junction Rd | Lockport | 14094 | 9 | Niagara | √ | √ |
| | Op | TGPC CS 233 | 2262 Dow Rd | York | 14533 | 8 | Livingston | √ | |
| | Op | TGPC CS 237 | 2001 Archer Road | Manchester, Phelps | 14432 | 8 | Ontario | √ | |
| | Op | TGPC CS 241 | 3447 Sentinel Heights Rd | LaFayette | 13084 | 7 | Onondaga | √ | √ |
| | Op | TGPC CS 245 | 457 Burrows Rd | Winfield | 13491 | 6 | Herkimer | √ | √ |
| | Op | TGPC CS 249 | 2480 US Route 20 | Carlisle | 12031 | 4 | Schoharie | √ | √ |
| | Op | TGPC CS 254 | ST Rte 66 | Chatham | 12123 | 4 | Columbia | √ | √ |
| | Op | TNG CS 249 - B | 2840 US Route 20 East | Carlisle | 12031 | 4 | Schoharie | | |
| | Op | TNG CS 405A | Mackey Rd | Woodhull | 14809 | 8 | Steuben | | |
| | Op | WP Dunbar CS | 414 Dunbar Rd | Windsor | 13865 | 7 | Broome | | √ |
| | App | DTI Horseheads CS | End of Bush Rd | Veteran | 14845 | 8 | Chemung | | |
| | App | ESPC Oakfield CS | 3309 Lockport Rd | Oakfield | 14125 | 8 | Genesee | | |
| | Prp | DTI CS Prp. | | Nassau | | 4 | Rensselaer | | |
| | Prp | DTI Sheds CS Prp. | Wilcox Rd | Georgetown | 13072 | 7 | Madison | | |
| | Prp | NFGSC Hinsdale CS | SE of Philips Rd | Hinsdale | 14743 | 9 | Cattaraugus | | |
| | Prp | TNG CS Prp. | 2060 Otego Rd | Franklin | 13775 | 3 | Sullivan | | |
| | Prp | TNG Hancock CS | 1579 Hungary Hill Rd | Hancock | 13783 | 4 | Delaware | | √ |
| | Prp | TNG Market Path CS-Prp | | Not released | | 4 | Schoharie | | |
| | Prp | TNG Supply Path Trail CS-Prp | | Not released | | 4 | Schoharie | | |
| | Prp-D | NFGSC Pendleton CS Prp-Denied | Killian Rd | Pendleton | | 9 | Niagara | | |

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2.5. Total Releases

2.5a. Releases by Chemical

Table 2.5a.1.

Total Pounds by Chemical (ranked)

NYS Natural Gas Compressor Stations, Reported NEI Emissions: 2008 to 2014

| Rank | Description | Pounds | | | | | | |
|------|--|-----------|-----------|-----------|-----------|-----------|------------|-------|
| | | 2008 | 2011 | 2014 | 3-Years | 3-Yr-Avg | 7 Years | % |
| 1 | Nitrogen oxides (NO2) | 2,269,341 | 2,993,049 | 2,487,284 | 7,749,673 | 2,583,224 | 18,082,571 | 45.22 |
| 2 | Carbon monoxide | 1,415,996 | 2,030,629 | 1,850,403 | 5,297,028 | 1,765,676 | 12,359,731 | 30.91 |
| 3 | Volatile organic compounds | 374,277 | 831,915 | 902,548 | 2,108,741 | 702,914 | 4,920,396 | 12.31 |
| 4 | Formaldehyde | 110,334 | 229,882 | 220,928 | 561,144 | 187,048 | 1,309,336 | 3.27 |
| 5 | PM10 Primary (Filt + Cond) | 107,946 | 242,279 | 189,665 | 539,890 | 179,963 | 1,259,744 | 3.15 |
| 6 | PM 2.5 Primary (Filt + Cond) | 92,595 | 220,983 | 160,507 | 474,085 | 158,028 | 1,106,198 | 2.77 |
| 7 | PM Condensable | 43,227 | 109,501 | 78,815 | 231,543 | 77,181 | 540,267 | 1.35 |
| 8 | Sulfur dioxide | 7,587 | 14,174 | 58,287 | 80,048 | 26,683 | 186,778 | 0.47 |
| 9 | Acetaldehyde | 4,385 | 15,091 | 8,797 | 28,272 | 9,424 | 65,969 | 0.16 |
| 10 | Acrolein | 3,226 | 11,742 | 7,628 | 22,596 | 7,532 | 52,723 | 0.13 |
| 11 | Benzene | 2,029 | 3,876 | 3,199 | 9,103 | 3,034 | 21,241 | 0.05 |
| 12 | Methanol | 1,381 | 4,324 | 2,580 | 8,286 | 2,762 | 19,333 | 0.05 |
| 13 | Toluene | 1,267 | 3,633 | 3,375 | 8,275 | 2,758 | 19,308 | 0.05 |
| 14 | Hexane, n- | 1,939 | 1,780 | 1,502 | 5,222 | 1,741 | 12,184 | 0.03 |
| 15 | Xylene (mixed isomers) | 360 | 1,460 | 1,777 | 3,598 | 1,199 | 8,394 | 0.02 |
| 16 | Butadiene, 1,3- | 273 | 999 | 751 | 2,022 | 674 | 4,719 | 0.01 |
| 17 | Trimethylpentane, 2,2,4- | 238 | 931 | 735 | 1,905 | 635 | 4,445 | 0.01 |
| 18 | Ethyl benzene | 155 | 577 | 466 | 1,198 | 399 | 2,794 | 0.01 |
| 19 | Ammonia | 262 | 238 | 174 | 674 | 225 | 1,573 | 0.00 |
| 20 | Phenol | 33 | 149 | 121 | 303 | 101 | 706 | 0.00 |
| 21 | Naphthalene | 50 | 154 | 94 | 298 | 99 | 696 | 0.00 |
| 22 | Nickel | 169 | 21 | 107 | 296 | 99 | 692 | 0.00 |
| 23 | Biphenyl | 68 | 178 | 49 | 296 | 99 | 690 | 0.00 |
| 24 | Methane dichloride [1910.1052] | 31 | 118 | 120 | 269 | 90 | 629 | 0.00 |
| 25 | Propylene oxide | 7 | 115 | 142 | 263 | 88 | 615 | 0.00 |
| 26 | Manganese | 104 | 0 | 47 | 150 | 50 | 350 | 0.00 |
| 27 | Ethylene dibromide | 29 | 71 | 49 | 149 | 50 | 347 | 0.00 |
| 28 | Tetrachloroethane, 1,1,2,2- | 26 | 64 | 42 | 132 | 44 | 309 | 0.00 |
| 29 | Carbon tetrachloride | 24 | 59 | 38 | 121 | 40 | 282 | 0.00 |
| 30 | Trichloroethane, 1,1,2- | 21 | 52 | 33 | 106 | 35 | 247 | 0.00 |
| 31 | Styrene | 18 | 49 | 33 | 100 | 33 | 234 | 0.00 |
| 32 | Chloroform | 18 | 45 | 19 | 83 | 28 | 193 | 0.00 |
| 33 | Methylnaphthalene, 2- | 15 | 55 | 12 | 82 | 27 | 191 | 0.00 |
| 34 | Chlorobenzene | 19 | 36 | 19 | 74 | 25 | 172 | 0.00 |
| 35 | Propylene dichloride | 17 | 35 | 18 | 70 | 23 | 164 | 0.00 |
| 36 | Dichloropropene, 1,3- (technical grade) | 17 | 34 | 18 | 69 | 23 | 161 | 0.00 |
| 37 | Ethylene dichloride | 16 | 32 | 17 | 65 | 22 | 151 | 0.00 |
| 38 | Ethylidene dichloride | 15 | 31 | 16 | 62 | 21 | 144 | 0.00 |
| 39 | Vinyl chloride | 10 | 24 | 12 | 46 | 15 | 107 | 0.00 |
| 40 | Mercury | 17 | 7 | 6 | 30 | 10 | 70 | 0.00 |
| 41 | Chromium (III) compounds (as Cr) | 16 | 0 | 7 | 24 | 8 | 56 | 0.00 |
| 42 | Phenanthrene | 4 | 14 | 2 | 21 | 7 | 48 | 0.00 |
| 43 | Polycyclic aromatic hydrocarbons, total (PAHs Total) | | 0 | 15 | 15 | 5 | 35 | 0.00 |
| 44 | Cadmium | 9 | 0 | 4 | 13 | 4 | 30 | 0.00 |
| 45 | Fluorene | 2 | 8 | 1 | 12 | 4 | 28 | 0.00 |

| Rank | Description | Pounds | | | | | | | |
|------|---|------------------|------------------|------------------|-------------------|------------------|-------------------|-------------|--|
| | | 2008 | 2011 | 2014 | 3-Years | 3-Yr-Avg | 7 Years | % | |
| 46 | Benz[a]anthracene | 4 | 2 | 2 | 8 | 3 | 19 | 0.00 | |
| 47 | Benzo(j,k)fluorene | 2 | 2 | 1 | 5 | 2 | 11 | 0.00 | |
| 48 | Anthracene | 0 | 4 | 0 | 4 | 1 | 10 | 0.00 | |
| 49 | Perchloroethylene [PERC PCE, Tetrachloroethylene] | 1 | 2 | 1 | 4 | 1 | 9 | 0.00 | |
| 50 | Acenaphthene | 1 | 2 | 1 | 4 | 1 | 8 | 0.00 | |
| 51 | Pyrene | 1 | 2 | 0 | 3 | 1 | 7 | 0.00 | |
| 52 | Ethyl chloride (Chloroethane) | 1 | 2 | 0 | 3 | 1 | 6 | 0.00 | |
| 53 | Acenaphthylene | 2 | | - | 2 | 1 | 5 | 0.00 | |
| 54 | Chrysene | 0 | 1 | 0 | 2 | 1 | 4 | 0.00 | |
| 55 | Chromium (VI) & inorganic Cr6+ compounds | 1 | 0 | 0 | 1 | 0 | 2.3 | 0.00 | |
| 56 | Benzo[g,h,i]perylene | 0 | 1 | 0 | 1 | 0 | 1.7 | 0.00 | |
| 57 | Benzo[b]fluoranthene | 0 | 0 | 0 | 0 | 0 | 0.7 | 0.00 | |
| 58 | Lead | 0 | 0 | 0 | 0 | 0 | 0.6 | 0.00 | |
| 59 | Benzo[e]pyrene | 0 | | | 0 | 0 | 0.09 | 0.00 | |
| 60 | Arsenic | 0 | 0 | 0 | 0 | 0 | 0.06 | 0.00 | |
| 61 | Cobalt | 0 | 0 | 0 | 0 | 0 | 0.03 | 0.00 | |
| 62 | Indeno[1,2,3-cd]pyrene | 0 | 0 | 0 | 0 | 0 | 0.02 | 0.00 | |
| 63 | Benzo[a]pyrene | 0 | 0 | 0 | 0 | 0 | 0.01 | 0.00 | |
| 64 | Selenium | 0 | 0 | 0 | 0 | 0 | 0.01 | 0.00 | |
| 65 | Perylene | 0 | | | 0 | 0 | 0.00 | 0.00 | |
| 66 | Beryllium | 0 | 0 | 0 | 0 | 0 | 0.00 | 0.00 | |
| 67 | Dimethylbenz[a]anthracene, 7,12- | | 0 | 0 | 0 | 0 | 0.00 | 0.00 | |
| 68 | Benzo[k]fluoranthene | 0 | | | 0 | 0 | 0.00 | 0.00 | |
| 69 | Methylcholanthrene, 3- | | 0 | - | 0 | 0 | 0.00 | 0.00 | |
| 70 | Dibenz[a,h]anthracene | 0 | | | 0 | 0 | 0.00 | 0.00 | |
| | | 4,437,584 | 6,718,435 | 5,980,468 | 17,136,487 | 5,712,162 | 39,985,136 | 100% | |

Table 2.5a.2.

Total Pounds by Chemical Category

NYS Natural Gas Compressor Stations, Reported NEI Emissions: 2008 to 2014

| Category | Rank | Description | 2008 | 2011 | 2014 | 3-Years | 3-Yr-Avg | 7 Years | % |
|---------------|------|----------------------------------|------------------|------------------|------------------|-------------------|------------------|---------------------|-------------|
| | | | 4,437,584 | 6,718,435 | 5,980,468 | 17,136,487 | 5,712,162 | 39,985,136 | 100% |
| Biphenyls | 23 | Biphenyl | 68 | 178 | 49 | 296 | 99 | 690 | 0.00 |
| CAPs | 1 | Nitrogen oxides (NO2) | 2,269,341 | 2,993,049 | 2,487,284 | 7,749,673 | 2,583,224 | 18,082,571 | 45.22 |
| CAPs | 2 | Carbon monoxide | 1,415,996 | 2,030,629 | 1,850,403 | 5,297,028 | 1,765,676 | 12,359,731 | 30.91 |
| CAPs | 8 | Sulfur dioxide | 7,587 | 14,174 | 58,287 | 80,048 | 26,683 | 186,778 | 0.47 |
| CAPs | 19 | Ammonia | 262 | 238 | 174 | 674 | 225 | 1,573 | 0.00 |
| | | | 3,693,186 | 5,038,090 | 4,396,148 | 13,127,423 | 4,375,808 | 30,630,653 | 76.6 |
| Metals | 66 | Beryllium | 0 | 0 | 0 | 0 | 0 | 0.00 | 0.00 |
| Metals, heavy | 22 | Nickel | 169 | 21 | 107 | 296 | 99 | 692 | 0.00 |
| Metals, heavy | 26 | Manganese | 104 | 0 | 47 | 150 | 50 | 350 | 0.00 |
| Metals, heavy | 40 | Mercury | 17 | 7 | 6 | 30 | 10 | 70 | 0.00 |
| Metals, heavy | 41 | Chromium (III) compounds (as Cr) | 16 | 0 | 7 | 24 | 8 | 56 | 0.00 |
| Metals, heavy | 44 | Cadmium | 9 | 0 | 4 | 13 | 4 | 30 | 0.00 |
| Metals, heavy | 55 | Cr6+ compounds | 1 | 0 | 0 | 1 | 0 | 2.3 | 0.00 |
| Metals, heavy | 58 | Lead | 0 | 0 | 0 | 0 | 0 | 0.6 | 0.00 |
| Metals, heavy | 60 | Arsenic | 0 | 0 | 0 | 0 | 0 | 0.06 | 0.00 |
| Metals, heavy | 61 | Cobalt | 0 | 0 | 0 | 0 | 0 | 0.03 | 0.00 |
| Metals, heavy | 64 | Selenium | 0 | 0 | 0 | 0 | 0 | 0.01 | 0.00 |
| | | | 316 | 28 | 171 | 514 | 171 | 171 | 0.00 |
| PAHs | 43 | Polycyclic aromatic hydrocarbons | | 0 | 15 | 15 | 5 | 35 | 0.00 |
| PAHs | 50 | Acenaphthene | 1 | 2 | 1 | 4 | 1 | 8 | 0.00 |
| PAHs | 59 | Benzo[e]pyrene | 0 | | | 0 | 0 | 0.09 | 0.00 |
| PAHs | 65 | Perylene | 0 | | | 0 | 0 | 0.00 | 0.00 |
| PM10 | 5 | PM10 Primary (Filt + Cond) | 107,946 | 242,279 | 189,665 | 539,890 | 179,963 | 1,259,744 | 3.15 |
| PM25 | 6 | PM 2.5 Primary (Filt + Cond) | 92,595 | 220,983 | 160,507 | 474,085 | 158,028 | 1,106,198 | 2.77 |
| | | | 200,542 | 463,262 | 350,172 | 1,013,994 | 337,997 | 2,365,985.09 | 5.92 |
| PM-CON | 7 | PM Condensable | 43,227 | 109,501 | 78,815 | 231,543 | 77,181 | 540,267 | 1.35 |
| Solvents | 20 | Phenol | 33 | 149 | 121 | 303 | 101 | 706 | 0.00 |
| SVOCs | 21 | Naphthalene | 50 | 154 | 94 | 298 | 99 | 696 | 0.00 |
| SVOCs | 33 | Methylnaphthalene, 2- | 15 | 55 | 12 | 82 | 27 | 191 | 0.00 |
| SVOCs | 42 | Phenanthrene | 4 | 14 | 2 | 21 | 7 | 48 | 0.00 |
| SVOCs | 45 | Fluorene | 2 | 8 | 1 | 12 | 4 | 28 | 0.00 |
| SVOCs | 46 | Benzo[a]anthracene | 4 | 2 | 2 | 8 | 3 | 19 | 0.00 |
| SVOCs | 47 | Benzo[j,k]fluorene | 2 | 2 | 1 | 5 | 2 | 11 | 0.00 |
| SVOCs | 48 | Anthracene | 0 | 4 | 0 | 4 | 1 | 10 | 0.00 |
| SVOCs | 51 | Pyrene | 1 | 2 | 0 | 3 | 1 | 7 | 0.00 |
| SVOCs | 53 | Acenaphthylene | 2 | 0 | 0 | 2 | 1 | 5 | 0.00 |
| SVOCs | 54 | Chrysene | 0 | 1 | 0 | 2 | 1 | 4 | 0.00 |
| SVOCs | 56 | Benzo[g,h,i]perylene | 0 | 1 | 0 | 1 | 0 | 1.7 | 0.00 |
| SVOCs | 57 | Benzo[b]fluoranthene | 0 | 0 | 0 | 0 | 0 | 0.7 | 0.00 |
| SVOCs | 62 | Indeno[1,2,3-cd]pyrene | 0 | 0 | 0 | 0 | 0 | 0.02 | 0.00 |
| SVOCs | 63 | Benzo[a]pyrene | 0 | 0 | 0 | 0 | 0 | 0.01 | 0.00 |
| SVOCs | 67 | Dimethylbenz[a]anthracene, 7,12- | 0 | 0 | 0 | 0 | 0 | 0.00 | 0.00 |
| SVOCs | 68 | Benzo[k]fluoranthene | 0 | 0 | 0 | 0 | 0 | 0.00 | 0.00 |
| SVOCs | 69 | Methylcholanthrene, 3- | 0 | 0 | 0 | 0 | 0 | 0.00 | 0.00 |
| SVOCs | 70 | Dibenz[a,h]anthracene | 0 | 0 | 0 | 0 | 0 | 0.00 | 0.00 |
| | | | 80 | 243 | 112 | 438 | 146 | 1021.43 | 0.0 |

| Category | Rank | Description | 2008 | 2011 | 2014 | 3-Years | 3-Yr-Avg | 7 Years | % |
|----------|------|---|----------------|------------------|------------------|------------------|----------------|------------------|-------------|
| VOCs | 3 | Volatile organic compounds | 374,277 | 831,915 | 902,548 | 2,108,741 | 702,914 | 4,920,396 | 12.31 |
| VOCs | 4 | Formaldehyde | 110,334 | 229,882 | 220,928 | 561,144 | 187,048 | 1,309,336 | 3.27 |
| VOCs | 9 | Acetaldehyde | 4,385 | 15,091 | 8,797 | 28,272 | 9,424 | 65,969 | 0.16 |
| VOCs | 10 | Acrolein | 3,226 | 11,742 | 7,628 | 22,596 | 7,532 | 52,723 | 0.13 |
| VOCs | 11 | Benzene | 2,029 | 3,876 | 3,199 | 9,103 | 3,034 | 21,241 | 0.05 |
| VOCs | 12 | Methanol | 1,381 | 4,324 | 2,580 | 8,286 | 2,762 | 19,333 | 0.05 |
| VOCs | 13 | Toluene | 1,267 | 3,633 | 3,375 | 8,275 | 2,758 | 19,308 | 0.05 |
| VOCs | 14 | Hexane, n- | 1,939 | 1,780 | 1,502 | 5,222 | 1,741 | 12,184 | 0.03 |
| VOCs | 15 | Xylene (mixed isomers) | 360 | 1,460 | 1,777 | 3,598 | 1,199 | 8,394 | 0.02 |
| VOCs | 16 | Butadiene, 1,3- | 273 | 999 | 751 | 2,022 | 674 | 4,719 | 0.01 |
| VOCs | 17 | Trimethylpentane, 2,2,4- | 238 | 931 | 735 | 1,905 | 635 | 4,445 | 0.01 |
| VOCs | 18 | Ethyl benzene | 155 | 577 | 466 | 1,198 | 399 | 2,794 | 0.01 |
| VOCs | 24 | Methane dichloride [1910.1052] | 31 | 118 | 120 | 269 | 90 | 629 | 0.00 |
| VOCs | 25 | Propylene oxide | 7 | 115 | 142 | 263 | 88 | 615 | 0.00 |
| VOCs | 27 | Ethylene dibromide | 29 | 71 | 49 | 149 | 50 | 347 | 0.00 |
| VOCs | 28 | Tetrachloroethane, 1,1,2,2- | 26 | 64 | 42 | 132 | 44 | 309 | 0.00 |
| VOCs | 29 | Carbon tetrachloride | 24 | 59 | 38 | 121 | 40 | 282 | 0.00 |
| VOCs | 30 | Trichloroethane, 1,1,2- | 21 | 52 | 33 | 106 | 35 | 247 | 0.00 |
| VOCs | 31 | Styrene | 18 | 49 | 33 | 100 | 33 | 234 | 0.00 |
| VOCs | 32 | Chloroform | 18 | 45 | 19 | 83 | 28 | 193 | 0.00 |
| VOCs | 34 | Chlorobenzene | 19 | 36 | 19 | 74 | 25 | 172 | 0.00 |
| VOCs | 35 | Propylene dichloride | 17 | 35 | 18 | 70 | 23 | 164 | 0.00 |
| VOCs | 36 | Dichloropropene, 1,3- | 17 | 34 | 18 | 69 | 23 | 161 | 0.00 |
| VOCs | 37 | Ethylene dichloride | 16 | 32 | 17 | 65 | 22 | 151 | 0.00 |
| VOCs | 38 | Ethylidene dichloride | 15 | 31 | 16 | 62 | 21 | 144 | 0.00 |
| VOCs | 39 | Vinyl chloride | 10 | 24 | 12 | 46 | 15 | 107 | 0.00 |
| VOCs | 49 | Perchloroethylene [PERC PCE, Tetrachloroethylene] | 1 | 2 | 1 | 4 | 1 | 9 | 0.00 |
| VOCs | 52 | Ethyl chloride (Chloroethane) | 1 | 2 | 0 | 3 | 1 | 6 | 0.00 |
| | | | 500,134 | 1,106,979 | 1,154,863 | 2,761,978 | 920,659 | 6,444,612 | 16.1 |

2.5c. Releases by Facility

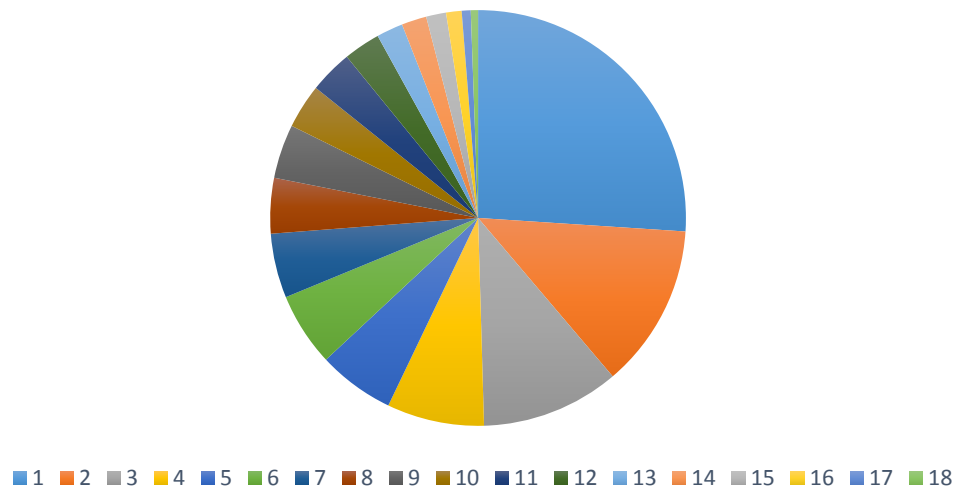
Table 2.5c.

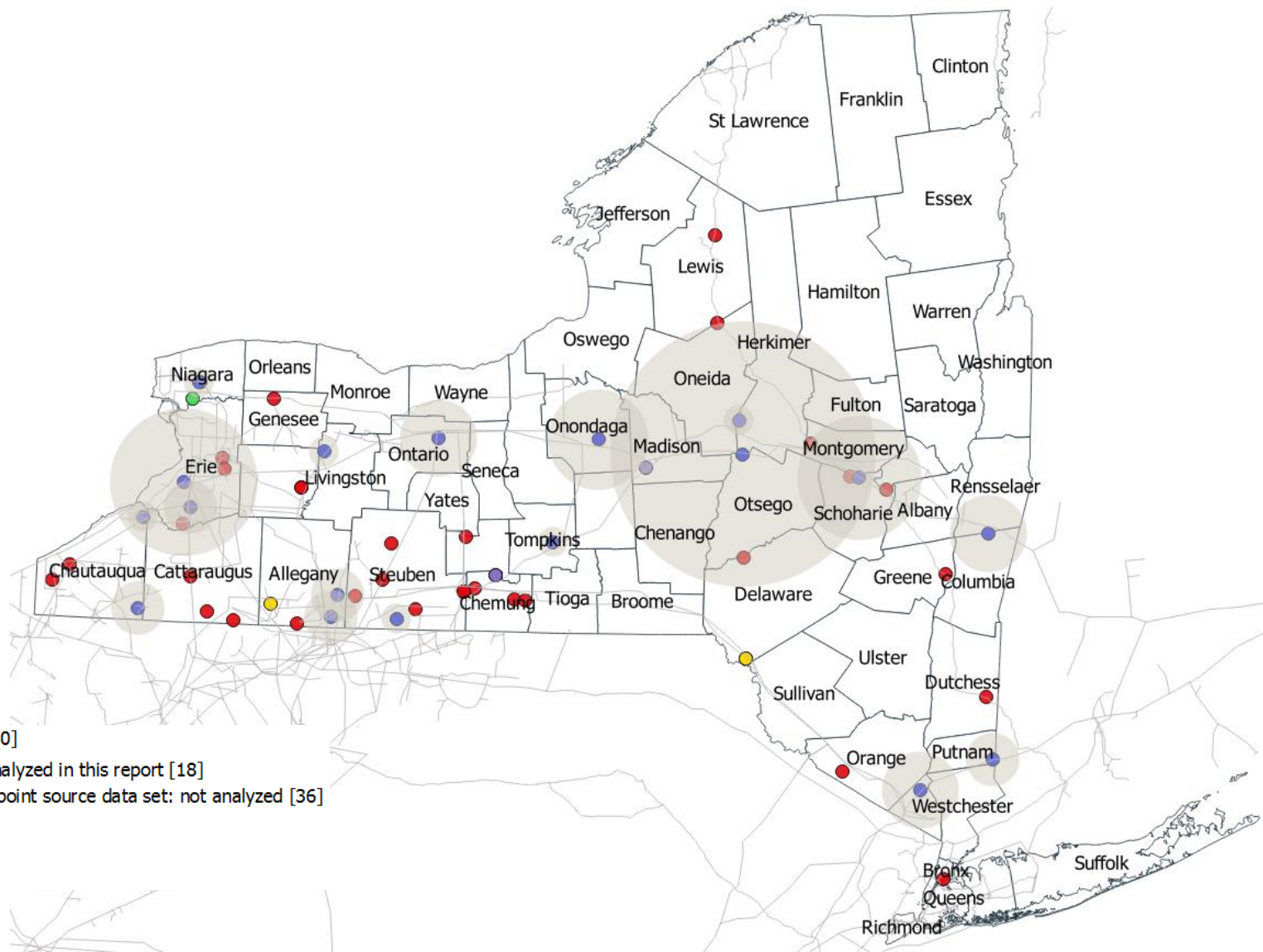
Total Pounds by Facility (ranked)

NYS Natural Gas Compressor Stations, Reported NEI Emissions: 2008 to 2014

| Rank | Identification | Location | | Chemicals | | | Pounds | | | | 7 Years (estimate) | |
|------|-----------------------|--------------------|------------|-----------|-----|-----|-----------|-----------|-----------|-----------|--------------------|-------|
| | Facility Name (Short) | Town | County | '08 | '11 | '14 | 2008 | 2011 | 2014 | Average | Pounds | % |
| 1 | TGPC CS 245 | Winfield | Herkimer | 49 | 47 | 25 | 750,288 | 1,877,949 | 1,856,930 | 1,495,056 | 10,465,389 | 26.04 |
| 2 | TGPC 229 & TEG DF | Eden | Erie | 52 | 47 | 48 | 499,504 | 1,160,934 | 535,745 | 732,061 | 5,124,427 | 12.75 |
| 3 | TGPC CS 249 | Carlisle | Schoharie | 49 | 27 | 26 | 712,001 | 569,088 | 571,747 | 617,612 | 4,323,285 | 10.76 |
| 4 | TGPC CS 241 | LaFayette | Onondaga | 47 | 37 | 46 | 297,485 | 574,214 | 431,014 | 434,237 | 3,039,661 | 7.56 |
| 5 | TGPC CS 254 | Chatham | Columbia | 27 | 16 | 9 | 288,373 | 260,770 | 476,712 | 341,952 | 2,393,661 | 5.96 |
| 6 | TGPC CS 237 | Manchester, Phelps | Ontario | 9 | 8 | 5 | 321,292 | 482,043 | 181,691 | 328,342 | 2,298,394 | 5.72 |
| 7 | AGT Stony Point CS | Stony Point | Rockland | 46 | 24 | 23 | 244,039 | 268,064 | 350,815 | 287,640 | 2,013,478 | 5.01 |
| 8 | NFGSC Concord CS | Concord | Erie | 11 | 10 | 12 | 364,989 | 993 | 376,805 | 247,596 | 1,733,171 | 4.31 |
| 9 | AGT Southeast CS | Southeast | Putnam | 27 | 18 | 46 | 161,097 | 255,290 | 307,392 | 241,259 | 1,688,815 | 4.20 |
| 10 | NFGSC Beech Hill CS | Willing | Allegany | 20 | 20 | 21 | 115,405 | 202,835 | 276,443 | 198,227 | 1,387,592 | 3.45 |
| 11 | NFGSC Independ. CS | Andover | Allegany | 15 | 10 | 17 | 119,762 | 210,879 | 249,615 | 193,419 | 1,353,931 | 3.37 |
| 12 | TGPC CS 224 | Clymer | Chautauqua | 47 | 45 | 47 | 44,133 | 391,407 | 55,945 | 163,828 | 1,146,797 | 2.85 |
| 13 | DTI Woodhull Station | Woodhull | Steuben | 44 | 54 | 58 | 104,802 | 209,130 | 41,449 | 118,460 | 829,223 | 2.06 |
| 14 | DTI Borger CS | Ithaca | Tompkins | 44 | 45 | 19 | 129,004 | 83,412 | 121,938 | 111,451 | 780,159 | 1.94 |
| 15 | NFGSC Nashville CS | Hanover | Chautauqua | 38 | 36 | | 100,466 | 77,474 | | 88,970 | 622,791 | 1.55 |
| 16 | TGPC CS 230-C | Lockport | Niagara | 27 | 26 | 27 | 83,451 | 2,791 | 121,877 | 69,373 | 485,610 | 1.21 |
| 17 | DTI Utica Station | Frankfort | Herkimer | 38 | 43 | 57 | 45,899 | 59,846 | 14,841 | 40,196 | 281,369 | 0.70 |
| 18 | TGPC CS 233 | York | Livingston | 27 | 16 | 4 | 55,594 | 31,316 | 9,510 | 32,140 | 224,978 | 0.56 |
| | | | | 67 | 65 | 66 | 4,437,584 | 6,718,435 | 5,980,468 | 5,712,162 | 40,192,733 | 100% |

NYS Compression Station Releases by Facility:
Total Pounds: 2008-2014





2.5c.1. Releases by Facility: Circular Area Air Pollution Profiles

Because most compressor stations are located in sparsely populated areas, it is widely believed that relatively few people are directly exposed to their air releases. An examination of actual population counts by distance from each station, reveals a more complex picture. While it is true that only 2,660 people live within ½ mile of the 18 compressor stations analyzed in this report, nearly 1.7 million live within 10-mile radius—more than 1 out of every 8 New Yorkers.

Table 2.5c.1a.

NYS Compressor Stations, Circular Area Profile, .05 to 30 Mile Radius: 2010

Total Population

| Compressor Station | Location | | | Radius in miles | | | | | | | | |
|----------------------|----------|------------|--------------------|-----------------|-------|--------|--------|--------|---------|---------|-----------|-----------|
| | Reg | County | Town | .05 | 1 | 2 | 3 | 5 | 10 | 15 | 20 | 30 |
| AG SE CS | 3 | Putnam | Southeast | 261 | 799 | 3,323 | 12,564 | 57,347 | 236,568 | 402,810 | 761,783 | 2,341,903 |
| AG Stony Point CS | 3 | Rockland | Stony Point | 704 | 2,158 | 10,310 | 24,626 | 62,433 | 330,569 | 700,546 | 1,292,599 | 5,268,668 |
| DTI Borger CS | 7 | Tompkins | Ithaca | 144 | 396 | 2,184 | 5,155 | 53,097 | 84,565 | 115,705 | 170,961 | 328,040 |
| DTI Utica Station | 6 | Herkimer | Frankfort | 45 | 254 | 1,406 | 6,243 | 56,734 | 148,087 | 192,498 | 255,438 | 363,367 |
| DTI Woodhull Station | 8 | Steuben | Woodhull | 2 | 57 | 371 | 950 | 2,130 | 12,947 | 24,941 | 66,963 | 175,182 |
| NFGSC Beech Hill CS | 9 | Allegany | Willing | 43 | 64 | 329 | 687 | 2,999 | 14,592 | 27,665 | 49,547 | 116,261 |
| NFGSC Concord CS | 9 | Erie | Concord | - | 125 | 579 | 1,346 | 4,168 | 38,139 | 129,370 | 262,634 | 866,137 |
| NFGSC Independ. CS | 9 | Allegany | Andover | 839 | 1,080 | 1,377 | 1,639 | 2,638 | 19,772 | 42,188 | 59,407 | 132,614 |
| NFGSC Nashville CS | 9 | Chautauqua | Hanover | 41 | 166 | 579 | 1,320 | 6,920 | 31,268 | 78,625 | 121,441 | 432,158 |
| TGPC CS 224 | 9 | Chautauqua | Clymer | 95 | 103 | 622 | 1,645 | 4,689 | 51,965 | 84,954 | 111,105 | 203,396 |
| TGPC CS 229 | 9 | Erie | Eden | 151 | 726 | 3,803 | 11,106 | 34,960 | 131,667 | 323,483 | 684,972 | 1,066,965 |
| TGPC CS 230-C | 9 | Niagara | Lockport | 12 | 359 | 2,202 | 5,922 | 39,624 | 145,809 | 485,700 | 836,986 | 1,095,236 |
| TGPC CS 233 | 8 | Livingston | York | 15 | 109 | 841 | 2,140 | 4,538 | 40,531 | 78,013 | 176,242 | 794,615 |
| TGPC CS 237 | 8 | Ontario | Manchester, Phelps | 27 | 211 | 796 | 5,815 | 12,654 | 72,831 | 143,122 | 266,572 | 810,144 |
| TGPC CS 241 | 7 | Onondaga | LaFayette | 218 | 460 | 1,627 | 4,484 | 25,469 | 257,224 | 385,855 | 496,520 | 704,663 |
| TGPC CS 245 | 6 | Herkimer | Winfield | - | 166 | 1,366 | 1,969 | 4,470 | 16,826 | 84,588 | 210,758 | 379,224 |
| TGPC CS 249 | 4 | Schoharie | Carlisle | - | 71 | 497 | 1,623 | 4,791 | 22,593 | 48,605 | 113,059 | 437,636 |
| TGPC CS 254 | 4 | Columbia | Chatham | 10 | 137 | 643 | 1,622 | 7,455 | 40,695 | 127,791 | 441,231 | 841,606 |

Table 2.5c.1b.

NYS Title V Compressor Stations, Circular Area Profile at 10-Mile Radius, Counties and Exposed Population

Total Population

| Compressor Station | Location | | Counties | | | | | | Exposed Population | | | | | |
|----------------------|----------|------------|----------|----|----|----|----|-------|--------------------|---------|----|----|-------|---------|
| | Reg | County | NY | CT | MA | NJ | PA | Total | NY | CT | MA | NJ | PA | Total |
| AG SE CS | 3 | Putnam | 3 | 0 | 0 | 0 | 0 | 3 | 83,417 | 148,176 | 0 | 0 | 0 | 231,593 |
| AG Stony Point CS | 3 | Rockland | 4 | 0 | 0 | 0 | 0 | 4 | 331,090 | 0 | 0 | 0 | 0 | 331,090 |
| DTI Borger CS | 7 | Tompkins | 1 | 0 | 0 | 0 | 0 | 1 | 80,226 | 0 | 0 | 0 | 0 | 80,226 |
| DTI Utica Station | 6 | Herkimer | 2 | 0 | 0 | 0 | 0 | 2 | 150,877 | 0 | 0 | 0 | 0 | 150,877 |
| DTI Woodhull Station | 8 | Steuben | 1 | 0 | 0 | 0 | 1 | 2 | 6,800 | 0 | 0 | 0 | 4,192 | 10,992 |
| NFGSC Beech Hill CS | 9 | Allegany | 2 | 0 | 0 | 0 | 1 | 3 | 12,650 | 0 | 0 | 0 | 1,305 | 13,955 |
| NFGSC Concord CS | 9 | Erie | 1 | 0 | 0 | 0 | 0 | 1 | 36,020 | 0 | 0 | 0 | 0 | 36,020 |
| NFGSC Independ. CS | 9 | Allegany | 2 | 0 | 0 | 0 | 0 | 2 | 19,472 | 0 | 0 | 0 | 0 | 19,472 |
| NFGSC Nashville CS | 9 | Chautauqua | 3 | 0 | 0 | 0 | 0 | 3 | 28,503 | 0 | 0 | 0 | 0 | 28,503 |
| TGPC CS 224 | 9 | Chautauqua | 2 | 0 | 0 | 0 | 1 | 3 | 49,999 | 0 | 0 | 0 | 2,695 | 52,694 |
| TGPC CS 229 | 9 | Erie | 1 | 0 | 0 | 0 | 0 | 1 | 136,180 | 0 | 0 | 0 | 0 | 136,180 |
| TGPC CS 230-C | 9 | Niagara | 2 | 0 | 0 | 0 | 0 | 2 | 144,562 | 0 | 0 | 0 | 0 | 144,562 |
| TGPC CS 233 | 8 | Livingston | 3 | 0 | 0 | 0 | 0 | 3 | 37,769 | 0 | 0 | 0 | 0 | 37,769 |
| TGPC CS 237 | 8 | Ontario | 2 | 0 | 0 | 0 | 0 | 2 | 68,821 | 0 | 0 | 0 | 0 | 68,821 |
| TGPC CS 241 | 7 | Onondaga | 1 | 0 | 0 | 0 | 0 | 1 | 254,062 | 0 | 0 | 0 | 0 | 254,062 |
| TGPC CS 245 | 6 | Herkimer | 4 | 0 | 0 | 0 | 0 | 4 | 16,828 | 0 | 0 | 0 | 0 | 16,828 |
| TGPC CS 249 | 4 | Schoharie | 3 | 0 | 0 | 0 | 0 | 3 | 24,041 | 0 | 0 | 0 | 0 | 24,041 |
| TGPC CS 254 | 4 | Columbia | 2 | 0 | 0 | 0 | 0 | 2 | 39,315 | 0 | 0 | 0 | 0 | 39,315 |

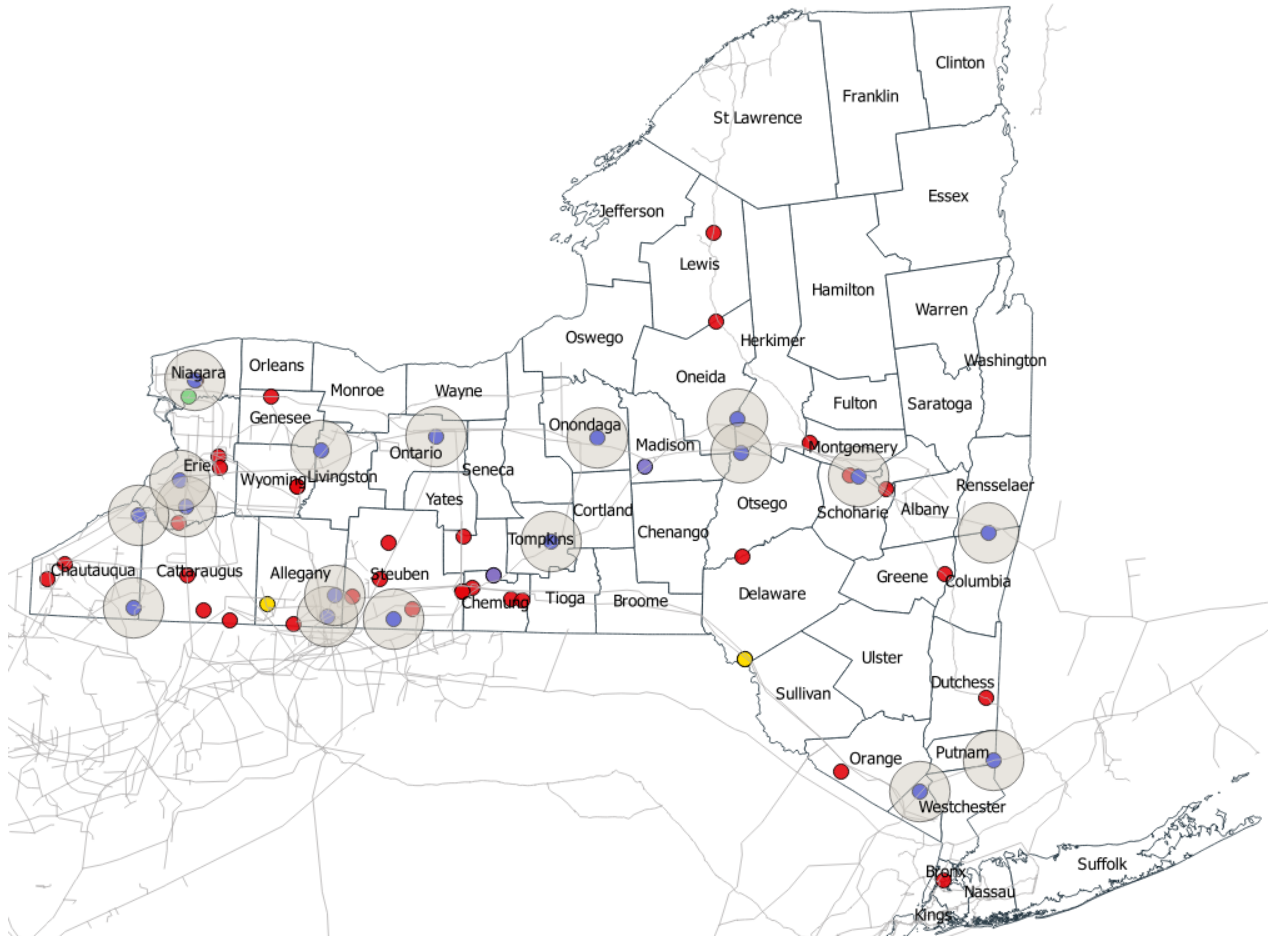


Table 2.5c.1c.

NYS Title V Compressor Stations, Circular Area Profile at 10-Mile Radius, By State and County

Total Population

| # | ST | County | 1. AG SE CS | 2. AG Stony Point CS | 3. DTI Borger CS | 4. DTI Utica Station | 5. DTI Woodhull Station | 6. FGSC Beech Hill CS | 7. NFGSC Concord CS | 8. NFGSC Independence CS | 9. NFGSC Nashville CS | 10. TGPC CS 224 | 11. TGPC CS 229 & TEG DF | 12. TGPC CS 230-C | 13. TGPC CS 233 | 14. TGPC CS 237 | 15. TGPC CS 241 | 16. TGPC CS 245 | 17. TGPC CS 249 | 18. TGPC CS 254 |
|----|----|-------------|-------------|----------------------|------------------|----------------------|-------------------------|-----------------------|---------------------|--------------------------|-----------------------|-----------------|--------------------------|-------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 1 | CT | Fairfield | √ | | | | | | | | | | | | | | | | | |
| 2 | NY | Allegany | | | | | | √ | | √ | | | | | | | | | | |
| 3 | NY | Cattaraugus | | | | | | | | | √ | √ | √ | | | | | | | |
| 4 | NY | Chautauqua | | | | | | | | | √ | √ | | | | | | | | |
| 5 | NY | Columbia | | | | | | | | | | | | | | | | | | √ |
| 6 | NY | Dutchess | | | | | | | | | | | | | | | | | | |
| 7 | NY | Erie | | | | | | | √ | | √ | | | √ | | | | | | |
| 8 | NY | Genesee | | | | | | | | | | | | | √ | | | | | |
| 9 | NY | Herkimer | | | | √ | | | | | | | | | | | | √ | | |
| 10 | NY | Livingston | | | | | | | | | | | | | √ | | | | | |
| 11 | NY | Madison | | | | | | | | | | | | | | | | √ | | |
| 12 | NY | Montgomery | | | | | | | | | | | | | | | | | √ | |
| 13 | NY | Niagara | | | | | | | | | | | | √ | | | | | | |
| 14 | NY | Oneida | | | | √ | | | | | | | | | | | | √ | | |
| 15 | NY | Onondaga | | | | | | | | | | | | | | | √ | | | |
| 16 | NY | Ontario | | | | | | | | | | | | | | √ | | | | |
| 17 | NY | Orange | | √ | | | | | | | | | | | | | | | | |
| 18 | NY | Otsego | | | | | | | | | | | | | | | | √ | | |
| 19 | NY | Putnam | √ | √ | | | | | | | | | | | | | | | | |
| 20 | NY | Rensselaer | | | | | | | | | | | | | | | | | | √ |
| 21 | NY | Rockland | | √ | | | | | | | | | | | | | | | | |
| 22 | NY | Schenectady | | | | | | | | | | | | | | | | | √ | |
| 23 | NY | Schoharie | | | | | | | | | | | | | | | | | √ | |
| 24 | NY | Steuben | | | | | √ | √ | | √ | | | | | | | | | | |
| 26 | NY | Tompkins | | | √ | | | | | | | | | | | | | | | |
| 25 | NY | Wayne | | | | | | | | | | | | | | √ | | | | |
| 27 | NY | Westchester | √ | √ | | | | | | | | | | | | | | | | |
| 28 | NY | Wyoming | | | | | | | | | | | | | √ | | | | | |
| 29 | PA | Potter | | | | | | √ | | | | | | | | | | | | |
| 30 | PA | Tioga | | | | | √ | | | | | | | | | | | | | |
| 31 | PA | Warren | | | | | | | | | | √ | | | | | | | | |

Table 2.5c.1d.

NYS Title V Compressor Stations, Circular Area Profile at 20-Mile Radius, Counties and Exposed Population

Total Population

| Compressor Station | Location | | Counties | | | | | | Exposed Population | | | | | |
|----------------------|----------|------------|----------|----|----|----|----|-------|--------------------|---------|--------|---------|--------|-----------|
| | Reg | County | NY | CT | MA | NJ | PA | Total | NY | CT | MA | NJ | PA | Total |
| AG SE CS | 3 | Putnam | 3 | 3 | 0 | 0 | 0 | 6 | 320,502 | 440,274 | 0 | 0 | 0 | 760,776 |
| AG Stony Point CS | 3 | Rockland | 4 | 0 | 0 | 2 | 0 | 6 | 983,807 | 0 | 0 | 300,950 | 0 | 1,284,757 |
| DTI Borger CS | 7 | Tompkins | 8 | 0 | 0 | 0 | 0 | 8 | 168,038 | 0 | 0 | 0 | 0 | 168,038 |
| DTI Utica Station | 6 | Herkimer | 4 | 0 | 0 | 0 | 0 | 4 | 258,872 | 0 | 0 | 0 | 0 | 258,872 |
| DTI Woodhull Station | 8 | Steuben | 2 | 0 | 0 | 0 | 2 | 4 | 48,746 | 0 | 0 | 0 | 15,138 | 63,884 |
| NFGSC Beech Hill CS | 9 | Allegany | 2 | 0 | 0 | 0 | 2 | 4 | 37,820 | 0 | 0 | 0 | 11,062 | 48,882 |
| NFGSC Concord CS | 9 | Erie | 4 | 0 | 0 | 0 | 0 | 4 | 258,402 | 0 | 0 | 0 | 0 | 258,402 |
| NFGSC Independ. CS | 9 | Allegany | 2 | 0 | 0 | 0 | 1 | 3 | 55,368 | 0 | 0 | 0 | 4,846 | 60,214 |
| NFGSC Nashville CS | 9 | Chautauqua | 3 | 0 | 0 | 0 | 0 | 3 | 122,243 | 0 | 0 | 0 | 0 | 122,243 |
| TGPC CS 224 | 9 | Chautauqua | 2 | 0 | 0 | 0 | 3 | 4 | 83,777 | 0 | 0 | 0 | 34,618 | 118,395 |
| TGPC CS 229 | 9 | Erie | 3 | 0 | 0 | 0 | 0 | 3 | 687,974 | 0 | 0 | 0 | 0 | 687,974 |
| TGPC CS 230-C | 9 | Niagara | 4 | 0 | 0 | 0 | 0 | 4 | 834,828 | 0 | 0 | 0 | 0 | 834,828 |
| TGPC CS 233 | 8 | Livingston | 5 | 0 | 0 | 0 | 0 | 5 | 172,667 | 0 | 0 | 0 | 0 | 172,667 |
| TGPC CS 237 | 8 | Ontario | 5 | 0 | 0 | 0 | 0 | 5 | 271,633 | 0 | 0 | 0 | 0 | 271,633 |
| TGPC CS 241 | 7 | Onondaga | 4 | 0 | 0 | 0 | 0 | 4 | 504,522 | 0 | 0 | 0 | 0 | 504,522 |
| TGPC CS 245 | 6 | Herkimer | 5 | 0 | 0 | 0 | 0 | 5 | 211,083 | 0 | 0 | 0 | 0 | 211,083 |
| TGPC CS 249 | 4 | Schoharie | 6 | 0 | 0 | 0 | 0 | 6 | 115,788 | 0 | 0 | 0 | 0 | 115,788 |
| TGPC CS 254 | 4 | Columbia | 4 | 0 | 1 | 0 | 0 | 5 | 376,937 | 0 | 65,680 | 0 | 0 | 442,617 |

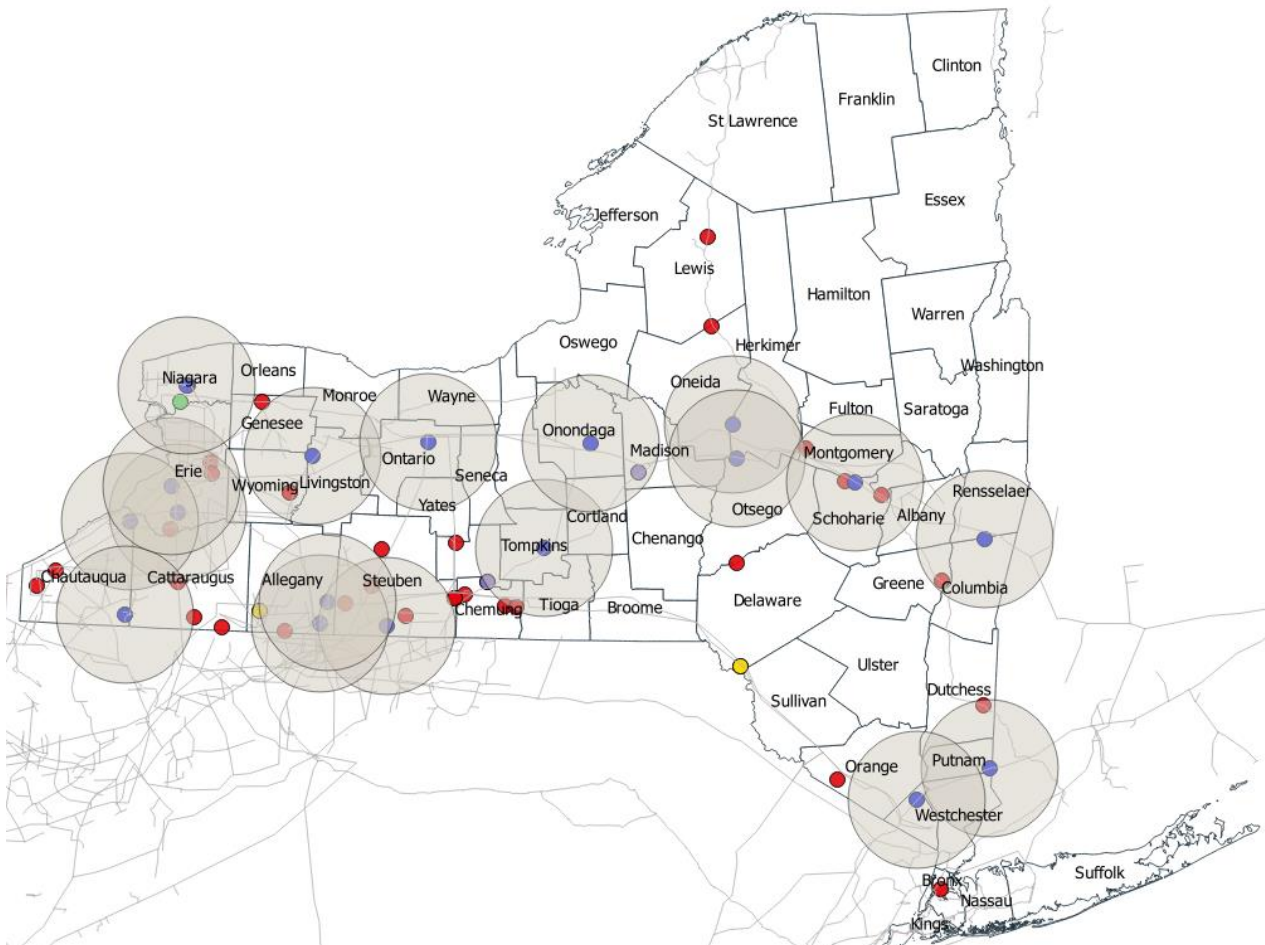


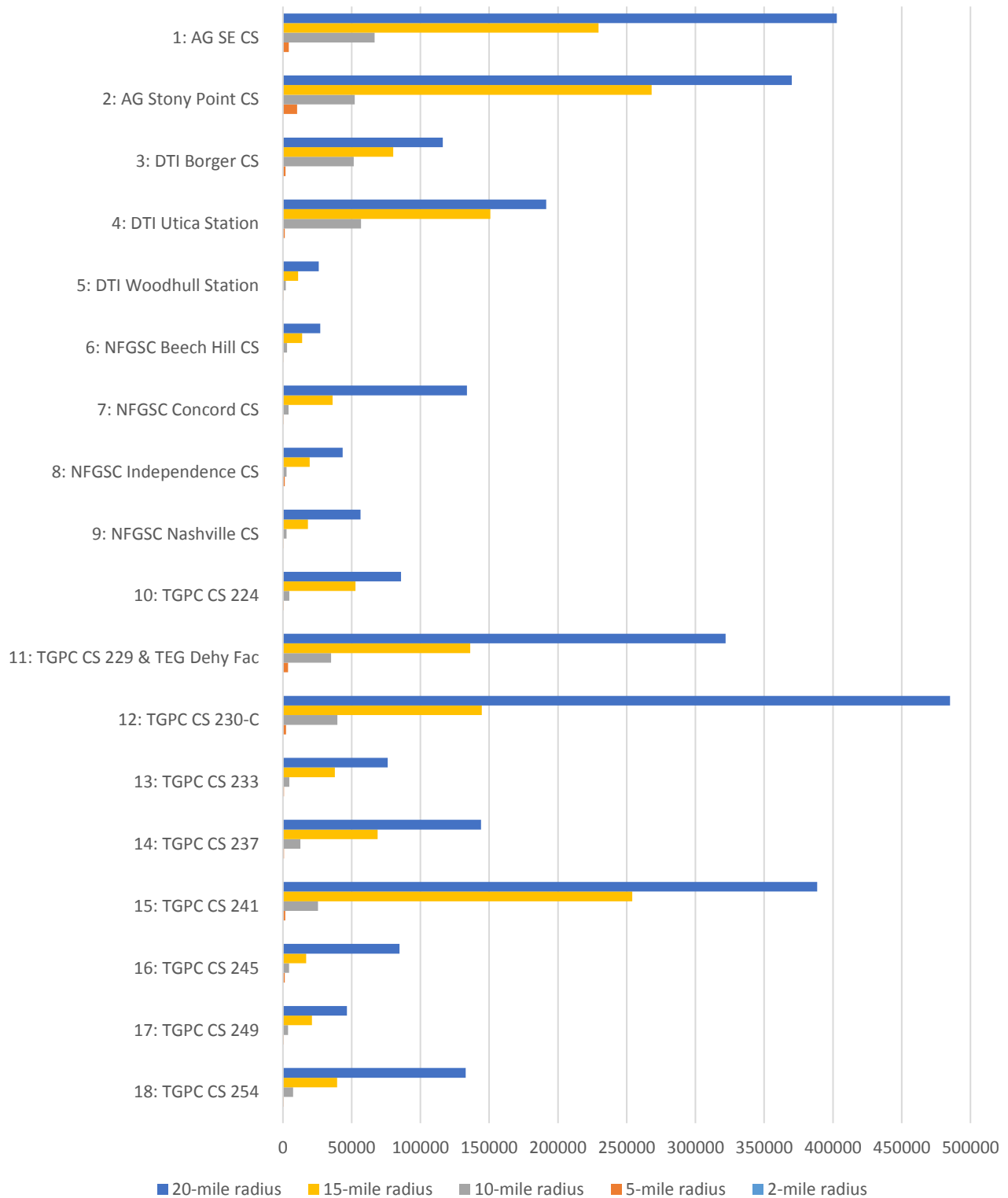
Table 2.5c.1e.

NYS Title V Compressor Stations, Circular Area Profile at 10-Mile Radius, By State and County

Total Population

| # | ST | County | 1. AG SE CS | 2. AG Stony Point CS | 3. DTI Borger CS | 4. DTI Utica Station | 5. DTI Woodhull Station | 6. FGSC Beech Hill CS | 7. NFGSC Concord CS | 8. NFGSC Independence CS | 9. NFGSC Nashville CS | 10. TGPC CS 224 | 11. TGPC CS 229 & TEG DF | 12. TGPC CS 230-C | 13. TGPC CS 233 | 14. TGPC CS 237 | 15. TGPC CS 241 | 16. TGPC CS 245 | 17. TGPC CS 249 | 18. TGPC CS 254 |
|----|----|-------------|-------------|----------------------|------------------|----------------------|-------------------------|-----------------------|---------------------|--------------------------|-----------------------|-----------------|--------------------------|-------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 1 | CT | Fairfield | √ | √ | | | | | | | | | | | | | | | | |
| 2 | CT | Litchfield | √ | | | | | | | | | | | | | | | | | |
| 3 | CT | New Haven | √ | | | | | | | | | | | | | | | | | |
| 4 | MA | Berkshire | | | | | | | | | | | | | | | | | | √ |
| 5 | NJ | Bergen | | √ | | | | | | | | | | | | | | | | |
| 6 | NJ | Passaic | | √ | | | | | | | | | | | | | | | | |
| 7 | NJ | Sussex | | √ | | | | | | | | | | | | | | | | |
| 8 | NY | Albany | | | | | | | | | | | | | | | | | √ | |
| 9 | NY | Allegany | | | | | √ | √ | | √ | | | | | | | | | | |
| 10 | NY | Broome | | | √ | | | | | | | | | | | | | | | |
| 11 | NY | Cattaraugus | | | | | | | √ | | √ | √ | √ | | | | | | | |
| 12 | NY | Cayuga | | | √ | | | | | | | | | | | | √ | | | |
| 13 | NY | Chautauqua | | | | | | | √ | | √ | √ | √ | | | | | | | |
| 14 | NY | Chemung | | | √ | | | | | | | | | | | | | | | |
| 15 | NY | Chenango | | | | | | | | | | | | | | | | √ | | |
| 16 | NY | Columbia | | | | | | | | | | | | | | | | | | √ |
| 17 | NY | Cortland | | | | | | | | | | | | | | | √ | | | |
| 18 | NY | Dutchess | | √ | | | | | | | | | | | | | | | | |
| 19 | NY | Erie | | | | | | | √ | | √ | | √ | √ | | | | | | |
| 20 | NY | Fulton | | | | | | | | | | | | | | | | | √ | |
| 21 | NY | Genesee | | | | | | | | | | | | | √ | | | | | |
| 22 | NY | Greene | | | | | | | | | | | | | | | | | | √ |
| 23 | NY | Herkimer | | | | √ | | | | | | | | | | | | √ | | |
| 24 | NY | Livingston | | | | | | | | | | | | √ | √ | | | | | |
| 25 | NY | Madison | | | | √ | | | | | | | | | | | √ | √ | | |
| 26 | NY | Montgomery | | | | | | | | | | | | | | | | | √ | |
| 27 | NY | Monroe | | | | | | | | | | | | √ | | √ | | | | |
| 28 | NY | Niagara | | | | | | | | | | | | √ | | | | | | |
| 29 | NY | Oneida | | | | √ | | | | | | | | | | | | √ | | |
| 30 | NY | Onondaga | | | | | | | | | | | | | | | √ | | | |
| 31 | NY | Ontario | | | | | | | | | | | | √ | | √ | | | | |
| 32 | NY | Orange | √ | √ | | | | | | | | | | | | | | | | |
| 33 | NY | Otsego | | | | √ | | | | | | | | | | | | √ | √ | |
| 34 | NY | Putnam | √ | √ | | | | | | | | | | | | | | | | |
| 35 | NY | Rensselaer | | | | | | | | | | | | | | | | | | √ |
| 36 | NY | Rockland | √ | √ | | | | | | | | | | | | | | | | |
| 37 | NY | Schenectady | | | | | | | | | | | | | | | | | √ | |
| 38 | NY | Schoharie | | | | | | | | | | | | | | | | | √ | |
| 39 | NY | Schuyler | | | √ | | | | | | | | | | | | | | | |
| 40 | NY | Seneca | | | | | | | | | | | | | | | | | | |
| 41 | NY | Steuben | | | | | √ | √ | | √ | | | | | | | | | | |
| 42 | NY | Tioga | | | √ | | | | | | | | | | | | | | | |
| 43 | NY | Tompkins | | | √ | | | | | | | | | | | | √ | | | |
| 44 | NY | Wayne | | | | | | | | | | | | | | √ | | | | |
| 45 | NY | Westchester | √ | √ | | | | | | | | | | | | | | | | |
| 46 | NY | Wyoming | | | | | | | √ | | | | | √ | √ | | | | | |
| 47 | NY | Yates | | | √ | | | | | | | | | | | √ | | | | |
| 48 | PA | Erie | | | | | | | | | | √ | | | | | | | | |
| 49 | PA | Potter | | | | | √ | √ | | √ | | | | | | | | | | |
| 50 | PA | Mc Kean | | | | | | | | | | √ | | | | | | | | |
| 51 | PA | Tioga | | | | | √ | √ | | | | | | | | | | | | |
| 52 | PA | Warren | | | | | | | | | | √ | | | | | | | | |

NYS Compressor Stations: 2008-2014
Exposed Populations by Facility: Circular Area Profile – 2, 5, 10, 15, 20 Mile Radii



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Table 2.5c.1c.

Total Population by Facility: Circular Area Profile – .05 to 30 Mile Radii

NYS Natural Gas Compressor Stations: 2008-2014

| Facility | | | Location | | Radius | | | | | | | | |
|------------------|-----------------|-------------------|-------------|-----------|--------|--------|--------|--------|---------|---------|-----------|-----------|---------|
| Address \ County | | | ST | County | .05 | 1 | 2 | 3 | 5 | 10 | 15 | 20 | 30 |
| 1 | AG SE CS | CT | Fairfield | 0 | 328 | 1,463 | 7,535 | 37,921 | 148,176 | 210,298 | 388,132 | 916,829 | |
| | Southeast NY | CT | Litchfield | 0 | 0 | 0 | 0 | 0 | 0 | 11,706 | 33,700 | 81,789 | |
| | Putnam County | CT | New Haven | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 18,442 | 276,243 | |
| | | NY | Dutchess | 0 | 0 | 0 | 0 | 0 | 0 | 13,654 | 58,321 | 110,574 | |
| | | NY | Orange | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 110,574 | |
| | | NY | Putnam | 0 | 471 | 1,640 | 4,143 | 16,964 | 58,575 | 83,472 | 96,206 | 99,710 | |
| | | NY | Rockland | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 165,975 | 135,426 | |
| | | NY | Westchester | 0 | 0 | 220 | 886 | 2,462 | 24,842 | 84,264 | 760,776 | 493,074 | |
| | | | | 261 | 799 | 3,323 | 12,564 | 57,347 | 231,593 | 403,394 | 760,776 | 2,354,578 | |
| | 2 | AG Stony Point CS | CT | Fairfield | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 259,310 |
| Stony Point NY | | NJ | Bergen | 0 | 0 | 0 | 0 | 0 | 0 | 65,233 | 269,249 | 875,306 | |
| Rockland County | | NJ | Essex | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 67,681 | |
| | | NJ | Hudson | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10,027 | |
| | | NJ | Morris | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 75,012 | |
| | | NJ | Passaic | 0 | 0 | 0 | 0 | 0 | 0 | 2,463 | 31,701 | 501,226 | |
| | | NJ | Sussex | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23,392 | 35,974 | |
| | | NY | Bronx | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,225,424 | |
| | | NY | Dutchess | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 213,509 | 126,685 | |
| | | NY | New York | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 363,983 | |
| | | NY | Orange | 0 | 0 | 0 | 0 | 0 | 37,831 | 109,807 | 48,959 | 346,935 | |
| | | NY | Putnam | 0 | 0 | 0 | 0 | 0 | 3,599 | 18,565 | 311,687 | 98,438 | |
| | | NY | Rockland | 704 | 2,158 | 10,310 | 24,626 | 55,121 | 213,075 | 304,874 | 386,260 | 311,687 | |
| | | NY | Ulster | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 22,511 | |
| | | NY | Westchester | 0 | 0 | 0 | 0 | 7,312 | 76,585 | 192,761 | 1,284,757 | 949,113 | |
| | | | | 704 | 2,158 | 10,310 | 24,626 | 62,433 | 331,090 | 693,703 | 1,284,757 | 5,269,312 | |
| 3 | | DTI Borger CS | NY | Broome | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,444 | 53,802 |
| | | Ithaca NY | NY | Cayuga | 0 | 0 | 0 | 0 | 0 | 0 | 985 | 5,103 | 16,463 |
| | Tompkins County | NY | Chemung | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 510 | 30,899 | |
| | | NY | Chenango | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 801 | |
| | | NY | Cortland | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 48,356 | |
| | | NY | Onondaga | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4,424 | |
| | | NY | Schuyler | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5,297 | 15,137 | |
| | | NY | Seneca | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2,154 | 6,979 | |
| | | NY | Tioga | 0 | 0 | 0 | 0 | 0 | 0 | 6,003 | 14,105 | 43,956 | |
| | | NY | Tompkins | 144 | 396 | 2,184 | 5,155 | 53,097 | 80,226 | 101,564 | 101,564 | 101,564 | |
| | | NY | Yates | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4,428 | |
| | | | | 0 | 0 | 0 | 0 | 0 | 80,226 | 116,305 | 168,038 | 326,809 | |

| Facility | | Location | | Radius | | | | | | | | |
|------------------|----------------------|----------|-------------|--------|-------|-------|-------|--------|---------|---------|---------|---------|
| Address \ County | | ST | County | .05 | 1 | 2 | 3 | 5 | 10 | 15 | 20 | 30 |
| 4 | DTI Utica Station | NY | Chenango | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5,724 |
| | DTI Utica CS | NY | Fulton | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,924 |
| | Herkimer County | NY | Herkimer | 45 | 254 | 1,083 | 2,181 | 4,163 | 29,631 | 42,888 | 57,351 | 62,261 |
| | | NY | Madison | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4,167 | 47,733 |
| | | NY | Montgomery | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6,928 |
| | | NY | Oneida | 0 | 0 | 323 | 4,062 | 52,571 | 121,246 | 146,635 | 193,064 | 219,207 |
| | | NY | Otsego | 0 | 0 | 0 | 0 | 0 | 0 | 1,901 | 4,290 | 19,201 |
| | | | | 45 | 254 | 1,406 | 6,243 | 56,734 | 150,877 | 191,424 | 258,872 | 362,978 |
| 5 | DTI Woodhull Station | NY | Allegany | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 684 | 20,261 |
| | Woodhull NY | NY | Chemung | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 22,692 |
| | Steuben County | NY | Schuyler | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,609 |
| | | NY | Steuben | 2 | 57 | 371 | 950 | 2,031 | 6,800 | 16,285 | 48,062 | 86,265 |
| | | PA | Bradford | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 814 |
| | | PA | Potter | 0 | 0 | 0 | 0 | 0 | 0 | 1,037 | 1,037 | 5,689 |
| | | PA | Tioga | 0 | 0 | 0 | 0 | 99 | 4,192 | 8,680 | 14,101 | 34,867 |
| | | | | 2 | 57 | 371 | 950 | 2,130 | 10,992 | 26,002 | 63,884 | 172,197 |
| 6 | FGSC Beech Hill CS | NY | Allegany | 43 | 64 | 329 | 687 | 2,605 | 12,105 | 19,352 | 28,464 | 42,429 |
| | Willing NY | NY | Cattaraugus | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11,656 |
| | Allegany County | NY | Steuben | 0 | 0 | 0 | 0 | 0 | 545 | 1,955 | 9,356 | 30,499 |
| | | PA | Mc Kean | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5,843 |
| | | PA | Potter | 0 | 0 | 0 | 0 | 394 | 1,305 | 5,867 | 7,868 | 15,351 |
| | | PA | Tioga | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3,194 | 8,590 |
| | | | | 43 | 64 | 329 | 687 | 2,999 | 13,995 | 27,174 | 48,882 | 114,368 |
| | | | | | | | | | | | | |
| 7 | NFGSC Concord CS | NY | Allegany | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2,130 |
| | Concord NY | NY | Cattaraugus | 0 | 0 | 0 | 0 | 0 | 0 | 11,290 | 19,042 | 46,639 |
| | Erie County | NY | Chautauqua | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5,989 | 40,323 |
| | | NY | Erie | 0 | 125 | 579 | 1,346 | 4,168 | 36,020 | 122,570 | 230,067 | 767,195 |
| | | NY | Genesee | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,155 |
| | | NY | Wyoming | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3,304 | 14,281 |
| | | | | 0 | 125 | 579 | 1,346 | 4,168 | 36,020 | 133,860 | 258,402 | 871,723 |
| | | | | | | | | | | | | |
| 8 | NFGSC Independ. CS | NY | Allegany | 839 | 1,080 | 1,377 | 1,639 | 2,491 | 18,062 | 25,189 | 31,630 | 47,605 |
| | Andover NY | NY | Cattaraugus | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4,246 |
| | Allegany County | NY | Livingston | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7,318 |
| | | NY | Steuben | 0 | 0 | 0 | 0 | 147 | 1,410 | 16,860 | 23,738 | 51,544 |
| | | PA | Mc Kean | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 641 |
| | | PA | Potter | 0 | 0 | 0 | 0 | 0 | 0 | 1,305 | 4,846 | 12,175 |
| | | PA | Tioga | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7,472 |
| | | | | 839 | 1,080 | 1,377 | 1,639 | 2,638 | 19,472 | 43,354 | 60,214 | 131,001 |
| 9 | NFGSC Nashville CS | NY | Cattaraugus | 0 | 0 | 19 | 147 | 866 | 4,721 | 8,266 | 11,894 | 29,459 |
| | Hanover NY | NY | Chautauqua | 41 | 166 | 560 | 1,173 | 5,505 | 10,774 | 39,199 | 48,450 | 110,414 |
| | Chautauqua County | PA | Erie | 0 | 0 | 0 | 0 | 549 | 13,008 | 32,427 | 61,899 | 292,670 |
| | | | | 41 | 166 | 579 | 1,320 | 6,920 | 28,503 | 79,892 | 122,243 | 432,543 |

| Facility | | Location | | Radius | | | | | | | | |
|------------------|-----------------------|----------|-------------|--------|-------|--------|---------|---------|---------|-----------|-----------|---------|
| Address \ County | | ST | County | .05 | 1 | 2 | 3 | 5 | 10 | 15 | 20 | 30 |
| 10 | TGPC CS 224 | NY | Cattaraugus | 0 | 0 | 12 | 43 | 253 | 2,866 | 5,803 | 13,694 | 33,184 |
| | Clymer NY | NY | Chautauqua | 95 | 103 | 610 | 1,602 | 4,321 | 47,133 | 59,704 | 70,083 | 104,211 |
| | Chautauqua County | PA | Erie | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 886 |
| | | PA | Mc Kean | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4,540 | 24,334 |
| | | PA | Warren | 0 | 0 | 0 | 0 | 115 | 2,695 | 20,317 | 30,078 | 39,983 |
| | | | | 95 | 103 | 622 | 1,645 | 4,689 | 52,694 | 85,824 | 118,395 | 206,884 |
| 11 | TGPC CS 229 & TEG DF | NY | Cattaraugus | 0 | 0 | 0 | 0 | 0 | 0 | 115 | 9,341 | 29,317 |
| | Eden NY | NY | Chautauqua | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5,152 | 29,114 |
| | Erie County | NY | Erie | 151 | 726 | 3,803 | 11,106 | 34,960 | 136,180 | 321,782 | 673,481 | 917,797 |
| | | NY | Genesee | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4,787 |
| | | NY | Niagara | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 72,143 |
| | | NY | Wyoming | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 17,502 |
| | | | 151 | 726 | 3,803 | 11,106 | 34,960 | 136,180 | 321,897 | 687,974 | 1,070,660 | |
| 12 | TGPC CS 230-C | NY | Erie | 0 | 0 | 0 | 0 | 0 | 33,009 | 277,098 | 607,651 | 822,818 |
| | Lockport NY | NY | Genesee | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,494 | 18,499 |
| | Niagara County | NY | Niagara | 12 | 359 | 2,202 | 5,922 | 39,624 | 111,553 | 208,081 | 216,469 | 216,469 |
| | | NY | Orleans | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9,214 | 26,607 |
| | | NY | Wyoming | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2,454 |
| | | 12 | 359 | 2,202 | 5,922 | 39,624 | 144,562 | 485,179 | 834,828 | 1,086,847 | | |
| 13 | TGPC CS 233 | NY | Allegany | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5,331 |
| | York NY | NY | Erie | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5,496 |
| | Livingston County | NY | Genesee | 0 | 0 | 0 | 22 | 368 | 6,581 | 14,360 | 42,808 | 60,079 |
| | | NY | Livingston | 15 | 109 | 841 | 2,013 | 3,579 | 26,388 | 41,687 | 56,647 | 65,393 |
| | | NY | Monroe | 0 | 0 | 0 | 0 | 0 | 0 | 5,632 | 44,228 | 571,226 |
| | | NY | Ontario | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2,148 | 36,095 |
| | | NY | Orleans | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11,958 |
| | | NY | Wyoming | 0 | 0 | 0 | 105 | 591 | 4,800 | 14,538 | 26,836 | 38,776 |
| | | 15 | 109 | 841 | 2,140 | 4,538 | 37,769 | 76,217 | 172,667 | 800,524 | | |
| 14 | TGPC CS 237 | NY | Cayuga | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20,233 |
| | Manchester, Phelps NY | NY | Livingston | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 22,671 |
| | Ontario County | NY | Monroe | 0 | 0 | 0 | | 0 | 0 | 3,963 | 75,265 | 509,857 |
| | | NY | Ontario | 27 | 211 | 796 | 5,815 | 12,654 | 53,584 | 93,899 | 100,200 | 107,931 |
| | | NY | Seneca | 0 | 0 | 0 | 0 | 0 | 0 | 7,558 | 20,829 | 33,097 |
| | | NY | Steuben | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3,370 |
| | | NY | Wayne | 0 | 0 | 0 | 0 | 0 | 15,237 | 37,245 | 64,847 | 90,461 |
| | | NY | Yates | 0 | 0 | 0 | 0 | 0 | 0 | 1,458 | 10,492 | 24,006 |
| | | 27 | 211 | 796 | 5,815 | 12,654 | 68,821 | 144,123 | 271,633 | 811,626 | | |
| 15 | TGPC CS 241 | NY | Cayuga | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7,841 | 71,871 |
| | LaFayette NY | NY | Chenango | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2,522 |
| | Onondaga County | NY | Cortland | 0 | 0 | 0 | 0 | 0 | 0 | 2,228 | 5,932 | 41,458 |
| | | NY | Madison | 0 | 0 | 0 | 0 | 0 | 0 | 16,456 | 30,214 | 63,437 |
| | | NY | Oneida | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8,338 |
| | | NY | Onondaga | 218 | 460 | 1,627 | 4,484 | 25,469 | 254,062 | 369,779 | 460,535 | 467,026 |
| | | NY | Oswego | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 36,965 |
| | | NY | Tompkins | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8,227 |
| | | 218 | 460 | 1,627 | 4,484 | 25,469 | 254,062 | 388,463 | 504,522 | 699,844 | | |

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| Facility | | Location | | Radius | | | | | | | |
|------------------|------------------|----------|-------------|--------|-----|-------|-------|-------|--------|---------|---------|
| Address \ County | ST | County | .05 | 1 | 2 | 3 | 5 | 10 | 15 | 20 | 30 |
| 16 | TGPC CS 245 | NY | Chenango | 0 | 0 | 0 | 0 | 0 | 0 | 3,307 | 20,317 |
| | Winfield NY | NY | Fulton | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,924 |
| | Herkimer County | NY | Herkimer | 0 | 166 | 1,263 | 1,528 | 2,261 | 5,179 | 36,884 | 49,510 |
| | | NY | Madison | 0 | 0 | 0 | 0 | 213 | 1,426 | 2,545 | 12,243 |
| | | NY | Montgomery | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9,217 |
| | | NY | Oneida | 0 | 0 | 0 | 108 | 966 | 5,933 | 35,350 | 128,462 |
| | | NY | Otsego | 0 | 0 | 103 | 333 | 1,030 | 4,290 | 10,013 | 17,561 |
| | | NY | Schoharie | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,000 |
| | | | | 0 | 166 | 1,366 | 1,969 | 4,470 | 16,828 | 84,792 | 211,083 |
| | | | | | | | | | | | 375,677 |
| 17 | TGPC CS 249 | NY | Albany | 0 | 0 | 0 | 0 | 0 | 0 | 8,411 | 96,415 |
| | Carlisle NY | NY | Delaware | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2,701 |
| | Schoharie County | NY | Fulton | 0 | 0 | 0 | 0 | 0 | 0 | 17,648 | 51,847 |
| | | NY | Greene | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2,887 |
| | | NY | Herkimer | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6,586 |
| | | NY | Montgomery | 0 | 0 | 21 | 174 | 728 | 4,630 | 5,093 | 46,944 |
| | | NY | Otsego | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3,476 |
| | | NY | Saratoga | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23,460 |
| | | NY | Schenectady | 0 | 0 | 0 | 0 | 0 | 1,437 | 9,936 | 154,727 |
| | | NY | Schoharie | 0 | 71 | 476 | 1,449 | 4,063 | 16,500 | 17,511 | 29,373 |
| | | | | 0 | 0 | 497 | 1,623 | 4,791 | 21,130 | 24,041 | 115,788 |
| | | | | | | | | | | | 435,076 |
| 18 | TGPC CS 254 | MA | Berkshire | 0 | 0 | 0 | 0 | 0 | 10,311 | 65,680 | 126,293 |
| | Chatham NY | NY | Albany | 0 | 0 | 0 | 0 | 0 | 24,105 | 194,709 | 298,289 |
| | Columbia County | NY | Columbia | 10 | 65 | 298 | 761 | 2,635 | 18,420 | 27,699 | 43,451 |
| | | NY | Greene | 0 | 0 | 0 | 0 | 0 | 2,869 | 14,566 | 38,909 |
| | | NY | Rensselaer | 0 | 72 | 345 | 861 | 4,820 | 20,895 | 67,895 | 124,211 |
| | | NY | Schenectady | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 102,292 |
| | | VT | Bennington | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5,096 |
| | | | | 10 | 137 | 643 | 1,622 | 7,455 | 39,315 | 132,879 | 442,617 |
| | | | | | | | | | | | 839,481 |

As we have already indicated, the distance air pollution travels and how much reaches ground level is dependent on many factors. On any given day, pollution from a given site can travel less than a mile, a few miles, hundreds of miles, thousands of miles, or around the globe.

A few local examples.

Chernobyl disaster

The meltdown of the Chernobyl nuclear power plant in the Ukraine on April 26, 1986, released 100 times more airborne radiation than the fallout from U.S. nuclear bombs dropped on Hiroshima and Nagasaki. More than 40% of Europe's land mass to the north and west had measurable amounts of radiation contamination, including Austria, Belarus, Bulgaria, Finland, France, Germany, Great Britain, Greece, Iceland, Italy, Norway, Romania, Slovenia, Sweden, and Switzerland, wide territories to the south including Armenia, Georgia, northern Africa and the Emirates, and China to the west. By May 6th, contamination reached Canada and the U.S. – more than half-way around the globe. (Yablokov and Nesterenko 2009, Gould 1990). The conclusion reached by the UN Scientific Committee on the Effects of Atomic Radiation is that the Chernobyl disaster "Resulted in radioactive material becoming widely dispersed and deposited . . . throughout the northern hemisphere." And that "[r]eleases of radioactive materials were such that contamination of the ground was found to some extent in every country in the Northern Hemisphere." (UNSCEAR 2011). Measurable amounts of Iodine-131 from Chernobyl fallout were found in fresh milk (Feely et al. 1988) and New York City's air along with Cesium-137 (U.S. DOE 1986), total ground deposition of Iodine-131 and Cesium-137 in Chester, New Jersey (U.S. DOE 1986), and gross beta particles in precipitation in Montpelier, Vermont (U.S. EPA 1986).

Fallout from U.S. Nuclear Weapons Tests: Rochester and Troy NY

At dawn on July 16, 1945 in the desert of Alamogordo, New Mexico, America exploded the world's first atomic weapon, code named "Trinity". Over the next few weeks Eastman Kodak headquarters were flooded with complaints from customers who had purchased sensitive X-ray film that it had been rendered unusable due to "fogging". Within a few weeks the company's scientists had determined that the strawboard, used as a stiffener board between film sheets produced in mills in Vincennes, Indiana had been contaminated "a new type radioactive containment not hitherto encountered." This, in turn, had produced black exposed spots on the company's film.

Alerted to the danger of open-air testing of nuclear weapons, Kodak began routinely measuring ambient radioactivity. In late January 29, 1951, the company's Geiger counters measured elevated levels of radioactivity brought to the ground by a winter snow storm. The radiation was the result of a 1-kiloton nuclear test that had taken place in Nevada two days earlier. On February 3, the *New York Times* ran a front-page story on the incident, highlighting the work of University of Rochester scientists who had quantified trace amounts of radioactivity in the city's snow. (Memmott 2016)

On April 28, 1953, the Geiger counters of Rensselaer Polytechnic Institute chemistry professor Herbert Clark began crackling away at surprising high levels. A severe rainstorm had brought down radiation from a nuclear test that had occurred three days earlier in the Nevada desert. The blast from the 11,000-lb. nuclear bomb code-named Simon had risen to a height of 44,000 feet above sea level, where 115 miles an hour winds carried it to Troy, some 2,300 miles downwind in just a few days. Levels of radioactivity in drinking water measured the next day were 100 to 1000 times greater than natural background radioactivity. (Clark 1954, Lade 1953, Lade 1962, Heller 2003).

Depleted Uranium Contamination: Albany and Colonie NY

From the late 1950s through 1980, the National Lead company and the U.S. government operated a facility on Central Avenue in Colonie, New York, that fashioned depleted uranium (DU) for use in U.S. armor-piercing shot and shell, and in the process exposed its workforce and nearby residents to significant levels of radioactive contaminants. During its years of operation there no efforts were made to systematically monitor air, soil, surface water or groundwater for excessive contamination at either the 18-acre work site or in the community where the plant was located. More than 20 years after the plant closed, researchers found measurable levels of DU among former workers and Colonie residents (Parrish et al. 2008). But DU contamination was not confined to National Lead property or even the nearby neighborhood of Roesseville. In the 1990s, air filters at Knolls Atomic Power Laboratory in Niskayuna, about 3.5 miles away, detected DU from National Lead. Even more alarming is that more than 25 miles away DU contamination was detected by the Kesselring Naval Nuclear Laboratory in Milton.

Elevated Rates of Birth Defects 10 miles from Natural Gas Wells

The chemicals found in the air around natural gas wells are generally the same chemicals found in compressor station emissions. McKenzie et al. found elevations in rates of birth defects of the cardiovascular system, and border-line elevations in rates of neurotube birth defects among people who live within ten miles of natural gas wells. This is a striking finding, as the study was of 124,842 births between 1996 and 2009, and the fact that birth defects are relatively rare and that more than half of the birth were the controls that did not live within ten miles of gas wells. There was also a significant association with the numbers of well and the distance. The author conclude that the result suggests a positive association between density and proximity to gas wells within a ten-mile radius and birth defects of the heart and possibly neurotube defects, but not with oral clefts, preterm birth or reduced fetal growth.

Small-Scale Spatial Variations

On the other end of the scale, small-scale spatial variations of only a few feet or yards have been shown to significantly effect personal exposure to ambient PAH concentrations. (Lovinsky-Desir et al. 2016)

Table 2.5c.1b.

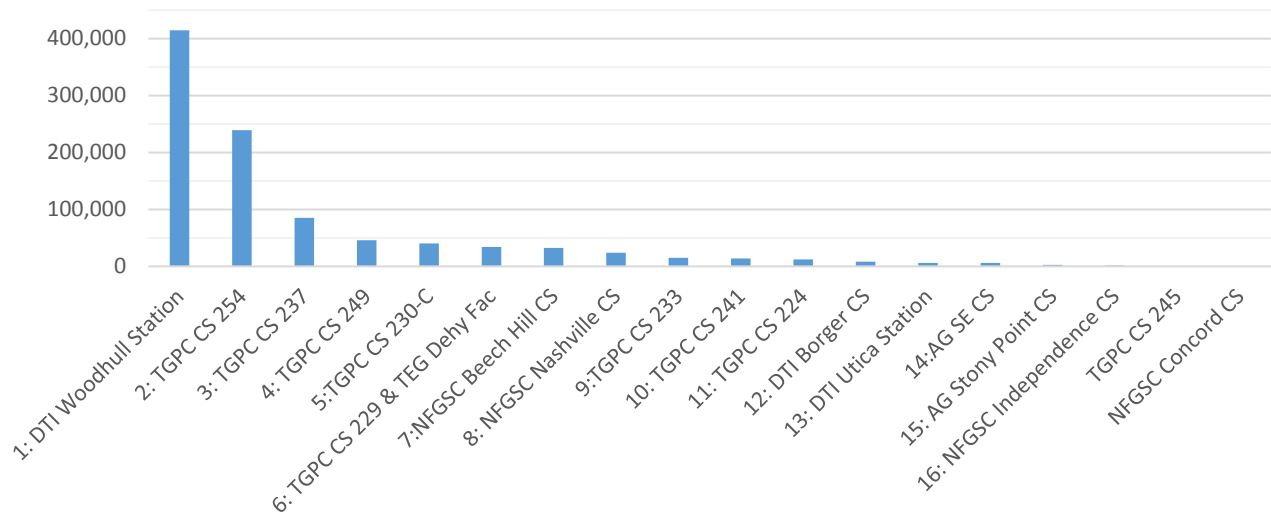
Total Pounds by Facility: Circular Area Air Pollution Profile – .05-Mile Radius

NYS Natural Gas Compressor Stations, Reported NEI Emissions: 2008 to 2014

| Rank | Identification | Location | | Releases | .05-Mile Radius | |
|------|-----------------------|--------------------|------------|-------------------|-----------------|-----------------|
| | Facility Name (Short) | Town | County | 7-Years | Population | Lbs. per capita |
| 1 | DTI Woodhull Station | Woodhull | Steuben | 829,223 | 2 | 414,611 |
| 2 | TGPC CS 254 | Chatham | Columbia | 2,393,660 | 10 | 239,366 |
| 3 | TGPC CS 237 | Manchester, Phelps | Ontario | 2,298,394 | 27 | 85,125 |
| 4 | TGPC CS 249 | Carlisle | Schoharie | 4,323,285 | 94 | 45,992 |
| 5 | TGPC CS 230-C | Lockport | Niagara | 485,609 | 12 | 40,467 |
| 6 | TGPC CS 229 & TEG DF | Eden | Erie | 5,124,426 | 151 | 33,936 |
| 7 | NFGSC Beech Hill CS | Willing | Allegany | 1,387,592 | 43 | 32,269 |
| 8 | NFGSC Nashville CS | Hanover | Chautauqua | 622,791 | 26 | 23,953 |
| 9 | TGPC CS 233 | York | Livingston | 224,978 | 15 | 14,998 |
| 10 | TGPC CS 241 | LaFayette | Onondaga | 3,039,661 | 218 | 13,943 |
| 11 | TGPC CS 224 | Clymer | Chautauqua | 1,146,797 | 95 | 12,071 |
| 12 | DTI Borger CS | Ithaca | Tompkins | 780,159 | 92 | 8,479 |
| 13 | DTI Utica Station | Frankfort | Herkimer | 281,369 | 45 | 6,252 |
| 14 | AG SE CS | Southeast | Putnam | 1,688,814 | 287 | 5,884 |
| 15 | AG Stony Point CS | Stony Point | Rockland | 2,013,478 | 704 | 2,860 |
| 16 | NFGSC Independence CS | Andover | Allegany | 1,353,931 | 839 | 1,613 |
| 17 | TGPC CS 245 | Winfield | Herkimer | 10,465,388 | 0 | -- |
| 18 | NFGSC Concord CS | Concord | Erie | 1,733,171 | 0 | -- |
| | | | | 40,192,726 | 2,660 | 15,110 |

NYS Compressor Station Releases: 2008-2014

Total Pounds by Facility: Circular Area Profile, 10-Mile Radius, Pounds per capita



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Table 2.5c.1c.

Total Pounds by Facility: Circular Area Air Pollution Profile – 1-Mile Radius

NYS Natural Gas Compressor Stations, Reported NEI Emissions: 2008 to 2014

| Rank | Identification | Location | | Releases | 1-Mile Radius | |
|------|-----------------------|--------------------|------------|-------------------|---------------|-----------------|
| | Facility Name (Short) | Town | County | 7-Years | Population | Lbs. per capita |
| 1 | TGPC CS 245 | Winfield | Herkimer | 10,465,388 | 166 | 124,588 |
| 2 | TGPC CS 249 | Carlisle | Schoharie | 4,323,285 | 154 | 28,073 |
| 3 | NFGSC Concord CS | Concord | Erie | 1,733,171 | 66 | 26,260 |
| 4 | NFGSC Beech Hill CS | Willing | Allegany | 1,387,592 | 64 | 21,681 |
| 5 | TGPC CS 254 | Chatham | Columbia | 2,393,661 | 137 | 17,472 |
| 6 | DTI Woodhull Station | Woodhull | Steuben | 829,223 | 57 | 14,548 |
| 7 | TGPC CS 224 | Clymer | Chautauqua | 1,146,797 | 103 | 11,134 |
| 8 | TGPC CS 237 | Manchester, Phelps | Ontario | 2,298,394 | 211 | 10,893 |
| 9 | TGPC CS 229 & TEG DF | Eden | Erie | 5,124,427 | 726 | 7,058 |
| 10 | TGPC CS 241 | LaFayette | Onondaga | 3,039,661 | 460 | 6,608 |
| 11 | NFGSC Nashville CS | Hanover | Chautauqua | 622,791 | 177 | 3,519 |
| 12 | TGPC CS 233 | York | Livingston | 224,978 | 109 | 2,064 |
| 13 | AG SE CS | Southeast | Putnam | 1,688,815 | 845 | 1,999 |
| 14 | DTI Borger CS | Ithaca | Tompkins | 780,159 | 396 | 1,970 |
| 15 | TGPC CS 230-C | Lockport | Niagara | 485,610 | 359 | 1,353 |
| 16 | NFGSC Independence CS | Andover | Allegany | 1,353,931 | 1080 | 1,254 |
| 17 | DTI Utica Station | Frankfort | Herkimer | 281,369 | 254 | 1,108 |
| 18 | AG Stony Point CS | Stony Point | Rockland | 2,013,478 | 2158 | 933 |
| | | | | 40,192,733 | 7,522 | 5,343 |

NYS Compressor Station Releases: 2008-2014

Total Pounds by Facility: Circular Area Profile, 1-Mile Radius, Pounds per capita

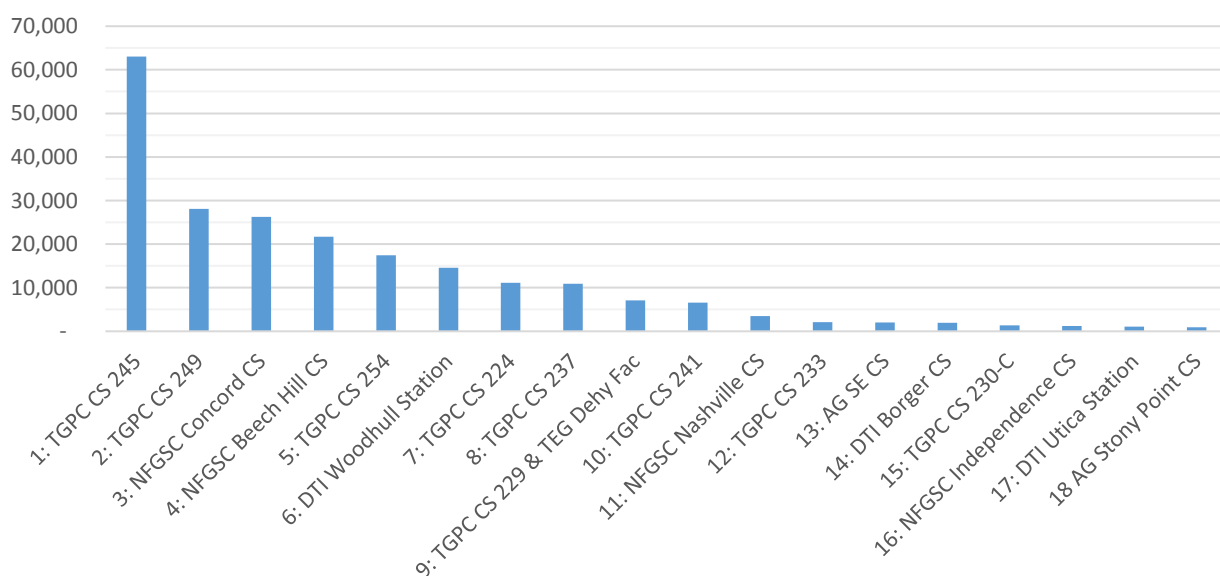


Table 2.5c.1d.

Total Pounds by Facility: Circular Area Air Pollution Profile – 2-Mile Radius

NYS Natural Gas Compressor Stations, Reported NEI Emissions: 2008 to 2014

| Rank | Identification | Location | | Releases | 2-Mile Radius | |
|------|-----------------------|--------------------|------------|-------------------|---------------|-----------------|
| | Facility Name (Short) | Town | County | 7-Years | Population | Lbs. per capita |
| 1 | TGPC CS 245 | Winfield | Herkimer | 10,465,389 | 1,366 | 7,661 |
| 2 | TGPC CS 249 | Carlisle | Schoharie | 4,323,285 | 675 | 6,405 |
| 3 | NFGSC Beech Hill CS | Willing | Allegany | 1,387,592 | 329 | 4,218 |
| 4 | TGPC CS 254 | Chatham | Columbia | 2,393,661 | 643 | 3,723 |
| 5 | NFGSC Concord CS | Concord | Erie | 1,733,171 | 529 | 3,276 |
| 6 | TGPC CS 237 | Manchester, Phelps | Ontario | 2,298,394 | 796 | 2,887 |
| 7 | DTI Woodhull Station | Woodhull | Steuben | 829,223 | 371 | 2,235 |
| 8 | TGPC CS 241 | LaFayette | Onondaga | 3,039,661 | 1,627 | 1,868 |
| 9 | TGPC CS 224 | Clymer | Chautauqua | 1,146,797 | 622 | 1,844 |
| 10 | NFGSC Nashville CS | Hanover | Chautauqua | 622,791 | 383 | 1,626 |
| 11 | TGPC CS 229 & TEG DF | Eden | Erie | 5,124,427 | 3,803 | 1,347 |
| 12 | NFGSC Independence CS | Andover | Allegany | 1,353,931 | 1,377 | 983 |
| 13 | DTI Borger CS | Ithaca | Tompkins | 780,159 | 1,879 | 415 |
| 14 | AG SE CS | Southeast | Putnam | 1,688,815 | 4,307 | 392 |
| 15 | TGPC CS 233 | York | Livingston | 224,978 | 841 | 268 |
| 16 | TGPC CS 230-C | Lockport | Niagara | 485,610 | 2,202 | 221 |
| 17 | DTI Utica Station | Frankfort | Herkimer | 281,369 | 1,406 | 200 |
| 18 | AG Stony Point CS | Stony Point | Rockland | 2,013,478 | 10,310 | 195 |
| | | | | 40,192,733 | 33,466 | 39,765 |

NYS Compressor Station Releases: 2008-2014

Total Pounds by Facility: Circular Area Profile, 2-Mile Radius, Pounds per capita

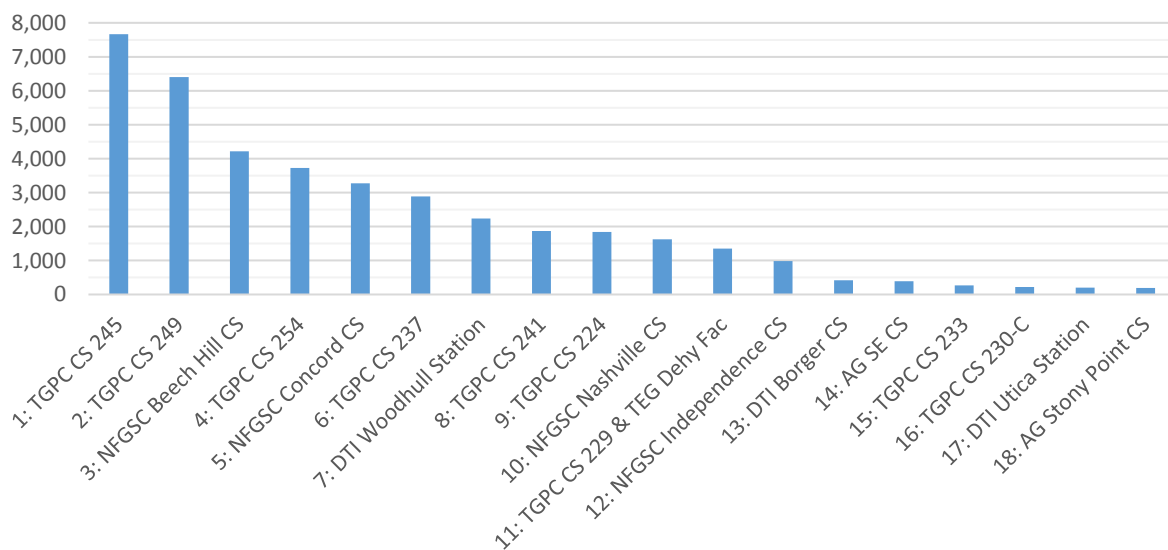


Table 2.5c.1d.

Total Pounds by Facility: Circular Area Air Pollution Profile – 3-Mile Radius

NYS Natural Gas Compressor Stations, Reported NEI Emissions: 2008 to 2014

| Rank | Identification | Location | | Releases | 3-Mile Radius | |
|------|-----------------------|--------------------|------------|-------------------|---------------|-----------------|
| | Facility Name (Short) | Town | County | 7-Years | Population | Lbs. per capita |
| 1 | TGPC CS 245 | Winfield | Herkimer | 10,465,388 | 1,969 | 5,315 |
| 2 | TGPC CS 249 | Carlisle | Schoharie | 4,323,285 | 1,266 | 3,414 |
| 3 | NFGSC Beech Hill CS | Willing | Allegany | 1,387,592 | 687 | 2,019 |
| 4 | TGPC CS 254 | Chatham | Columbia | 2,393,660 | 1,622 | 1,475 |
| 5 | NFGSC Concord CS | Concord | Erie | 1,733,171 | 1,297 | 1,336 |
| 6 | NFGSC Nashville CS | Hanover | Chautauqua | 622,791 | 675 | 922 |
| 7 | DTI Woodhull Station | Woodhull | Steuben | 829,223 | 950 | 872 |
| 8 | NFGSC Independence CS | Andover | Allegany | 1,353,931 | 1,639 | 826 |
| 9 | TGPC CS 224 | Clymer | Chautauqua | 1,146,797 | 1,645 | 697 |
| 10 | TGPC CS 241 | LaFayette | Onondaga | 3,039,661 | 4,484 | 677 |
| 11 | TGPC CS 229 & TEG DF | Eden | Erie | 5,124,426 | 11,106 | 461 |
| 12 | TGPC CS 237 | Manchester, Phelps | Ontario | 2,298,394 | 5,815 | 395 |
| 13 | DTI Borger CS | Ithaca | Tompkins | 780,159 | 5,165 | 151 |
| 14 | AG SE CS | Southeast | Putnam | 1,688,814 | 13,824 | 122 |
| 15 | TGPC CS 233 | York | Livingston | 224,978 | 2,140 | 105 |
| 16 | TGPC CS 230-C | Lockport | Niagara | 485,609 | 5,922 | 82 |
| 17 | AG Stony Point CS | Stony Point | Rockland | 2,013,478 | 24,626 | 81 |
| 18 | DTI Utica Station | Frankfort | Herkimer | 281,369 | 6,243 | 45 |
| | | | | 40,192,726 | 91,075 | 441 |

NYS Compressor Station Releases: 2008-2014

Total Pounds by Facility: Circular Area Profile, 3-Mile Radius, Pounds per capita

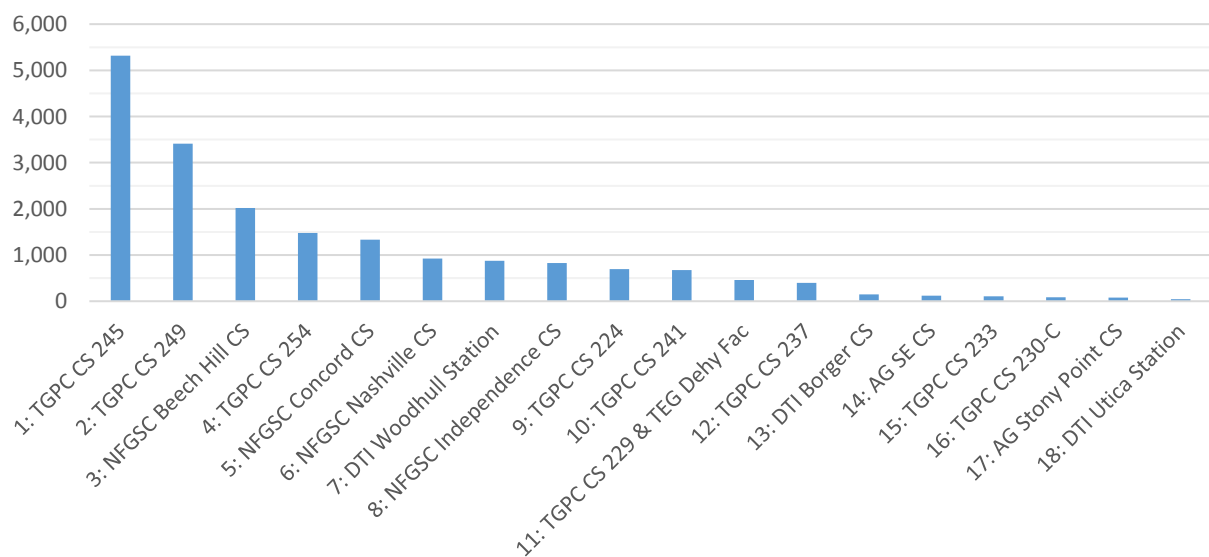


Table 2.5c.1f.

Total Pounds by Facility: Circular Area Air Pollution Profile – 5-Mile Radius

NYS Natural Gas Compressor Stations, Reported NEI Emissions: 2008 to 2014

| Rank | Identification | Location | | Releases | 5-Mile Radius | |
|------|-----------------------|--------------------|------------|-------------------|----------------|-----------------|
| | Facility Name (Short) | Town | County | 7-Years | Population | Lbs. per capita |
| 1 | TGPC CS 245 | Winfield | Herkimer | 10,465,389 | 4,470 | 2,341 |
| 2 | TGPC CS 249 | Carlisle | Schoharie | 4,323,285 | 3,668 | 1,179 |
| 3 | NFGSC Independence CS | Andover | Allegany | 1,353,931 | 2,638 | 513 |
| 4 | NFGSC Beech Hill CS | Willing | Allegany | 1,387,592 | 2,999 | 463 |
| 5 | NFGSC Concord CS | Concord | Erie | 1,733,171 | 3,931 | 441 |
| 6 | DTI Woodhull Station | Woodhull | Steuben | 829,223 | 2,130 | 389 |
| 7 | TGPC CS 254 | Chatham | Columbia | 2,393,661 | 7,455 | 321 |
| 8 | TGPC CS 224 | Clymer | Chautauqua | 1,146,797 | 4,689 | 245 |
| 9 | NFGSC Nashville CS | Hanover | Chautauqua | 622,791 | 2,584 | 241 |
| 10 | TGPC CS 237 | Manchester, Phelps | Ontario | 2,298,394 | 12,654 | 182 |
| 11 | TGPC CS 229 & TEG DF | Eden | Erie | 5,124,427 | 34,960 | 147 |
| 12 | TGPC CS 241 | LaFayette | Onondaga | 3,039,661 | 25,469 | 119 |
| 13 | TGPC CS 233 | York | Livingston | 224,978 | 4,538 | 50 |
| 14 | AG Stony Point CS | Stony Point | Rockland | 2,013,478 | 62,433 | 32 |
| 15 | AG SE CS | Southeast | Putnam | 1,688,815 | 66,671 | 25 |
| 16 | DTI Borger CS | Ithaca | Tompkins | 780,159 | 51,509 | 15 |
| 17 | TGPC CS 230-C | Lockport | Niagara | 485,610 | 39,624 | 12 |
| 18 | DTI Utica Station | Frankfort | Herkimer | 281,369 | 56,734 | 5 |
| | | | | 40,192,733 | 389,156 | 103 |

NYS Compressor Station Releases: 2008-2014

Total Pounds by Facility: Circular Area Profile, 5-Mile Radius, Pounds per capita

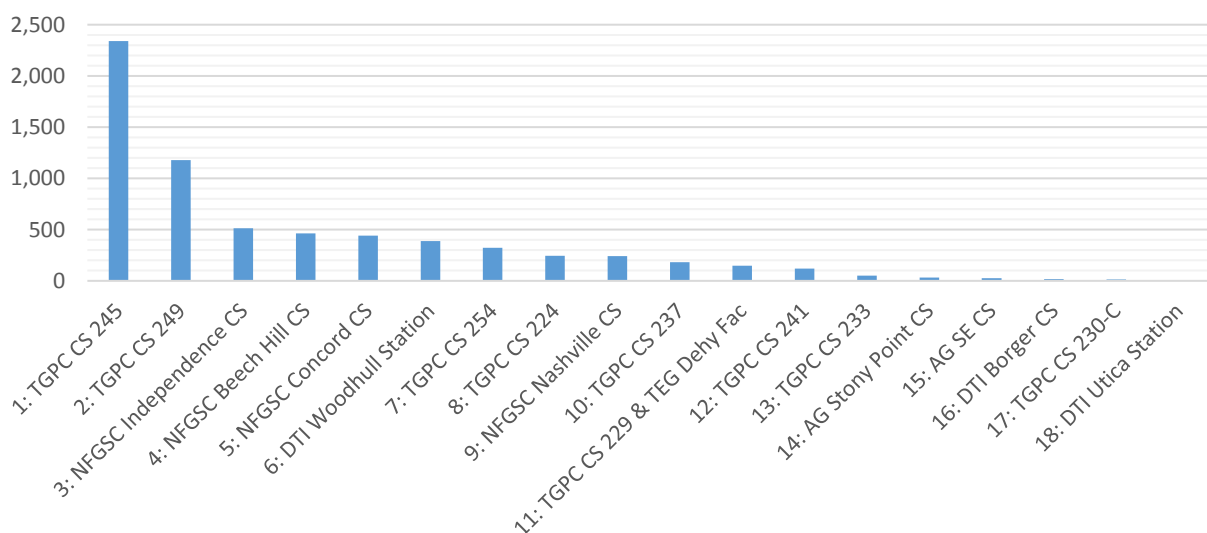


Table 2.5c.1g.

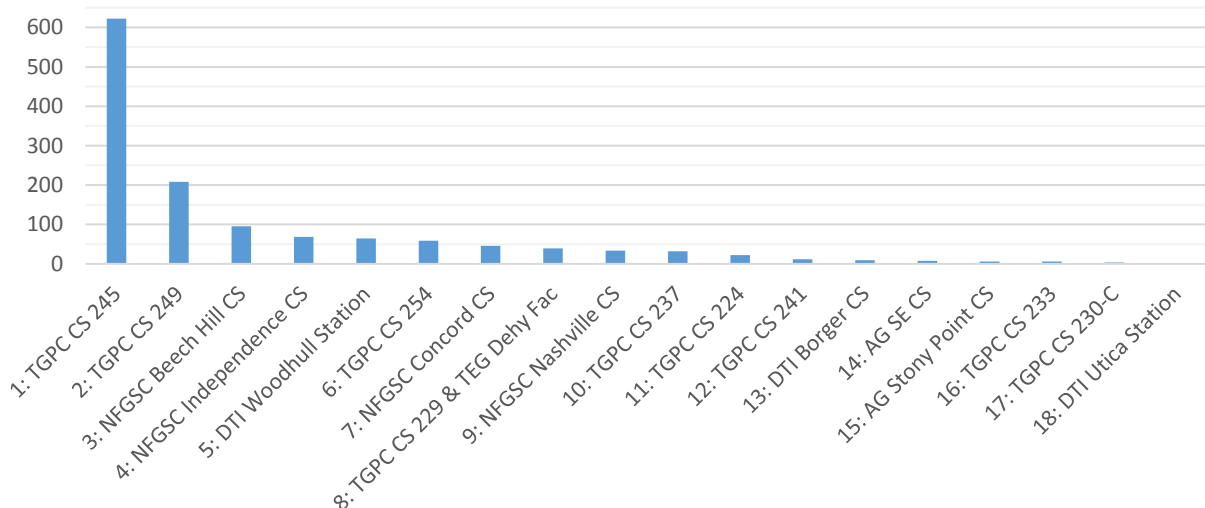
Total Pounds by Facility: Circular Area Air Pollution Profile – 10-Mile Radius

NYS Natural Gas Compressor Stations, Reported NEI Emissions: 2008 to 2014

| Rank | Identification | Location | | Releases | 10-Mile Radius | |
|------|-----------------------|--------------------|------------|-------------------|------------------|-----------------|
| | Facility Name (Short) | Town | County | 7-Years | Population | Lbs. per capita |
| 1 | TGPC CS 245 | Winfield | Herkimer | 10,465,389 | 16,826 | 622 |
| 2 | TGPC CS 249 | Carlisle | Schoharie | 4,323,285 | 20,745 | 208 |
| 3 | NFGSC Beech Hill CS | Willing | Allegany | 1,387,592 | 14,592 | 95 |
| 4 | NFGSC Independence CS | Andover | Allegany | 1,353,931 | 19,772 | 68 |
| 5 | DTI Woodhull Station | Woodhull | Steuben | 829,223 | 12,947 | 64 |
| 6 | TGPC CS 254 | Chatham | Columbia | 2,393,661 | 40,695 | 59 |
| 7 | NFGSC Concord CS | Concord | Erie | 1,733,171 | 37,974 | 46 |
| 8 | TGPC CS 229 & TEG DF | Eden | Erie | 5,124,427 | 131,667 | 39 |
| 9 | NFGSC Nashville CS | Hanover | Chautauqua | 622,791 | 18,661 | 33 |
| 10 | TGPC CS 237 | Manchester, Phelps | Ontario | 2,298,394 | 72,831 | 32 |
| 11 | TGPC CS 224 | Clymer | Chautauqua | 1,146,797 | 51,965 | 22 |
| 12 | TGPC CS 241 | LaFayette | Onondaga | 3,039,661 | 257,224 | 12 |
| 13 | DTI Borger CS | Ithaca | Tompkins | 780,159 | 84,577 | 9 |
| 14 | AG SE CS | Southeast | Putnam | 1,688,815 | 235,473 | 7 |
| 15 | AG Stony Point CS | Stony Point | Rockland | 2,013,478 | 330,569 | 6 |
| 16 | TGPC CS 233 | York | Livingston | 224,978 | 40,531 | 6 |
| 17 | TGPC CS 230-C | Lockport | Niagara | 485,610 | 145,809 | 3 |
| 18 | DTI Utica Station | Frankfort | Herkimer | 281,369 | 148,087 | 2 |
| | | | | 40,192,733 | 1,680,945 | 24 |

NYS Compressor Station Releases: 2008-2014

Total Pounds by Facility: Circular Area Profile, 10-Mile Radius, Pounds per capita



2.5c.2. Total Pounds by Facility: Annual, Monthly, Daily and Hourly Averages

Table 2.5c.

Total Pounds by Facility: Annual, Monthly, Daily and Hourly Averages

NYS Natural Gas Compressor Stations, Reported NEI Emissions: 2008 to 2014

| Rank | Identification | Location | | 7 Years Total | Annual Average | Monthly Average | Daily Average | Hourly Average |
|------|-----------------------|--------------------|------------|-------------------|-------------------|--------------------|------------------|-------------------|
| | Facility Name (Short) | Town | County | | | | | |
| 1 | TGPC CS 245 | Winfield | Herkimer | 10,465,388 | 1,495,055 | 124,588 | 4,096 | 171 |
| 2 | TGPC 229 & TEG DF | Eden | Erie | 5,124,426 | 732,061 | 61,005 | 2,006 | 84 |
| 3 | TGPC CS 249 | Carlisle | Schoharie | 4,323,285 | 617,612 | 51,468 | 1,692 | 71 |
| 4 | TGPC CS 241 | LaFayette | Onondaga | 3,039,661 | 434,237 | 36,186 | 1,190 | 50 |
| 5 | TGPC CS 254 | Chatham | Columbia | 2,393,660 | 341,951 | 28,496 | 937 | 39 |
| 6 | TGPC CS 237 | Manchester, Phelps | Ontario | 2,298,394 | 328,342 | 27,362 | 900 | 37 |
| 7 | AGT Stony Point CS | Stony Point | Rockland | 2,013,478 | 287,640 | 23,970 | 788 | 33 |
| 8 | NFGSC Concord CS | Concord | Erie | 1,733,171 | 247,596 | 20,633 | 678 | 28 |
| 9 | AGT SOUTHEAST CS | Southeast | Putnam | 1,688,814 | 241,259 | 20,105 | 661 | 28 |
| 10 | NFGSC Beech Hill CS | Willing | Allegany | 1,387,592 | 198,227 | 16,519 | 543 | 23 |
| 11 | NFGSC Independence CS | Andover | Allegany | 1,353,931 | 193,419 | 16,118 | 530 | 22 |
| 12 | TGPC CS 224 | Clymer | Chautauqua | 1,146,797 | 163,828 | 13,652 | 449 | 19 |
| 13 | DTI Woodhull Station | Woodhull | Steuben | 829,223 | 118,460 | 9,872 | 325 | 14 |
| 14 | DTI Borger CS | Ithaca | Tompkins | 780,159 | 111,451 | 9,288 | 305 | 13 |
| 15 | NFGSC Nashville CS | Hanover | Chautauqua | 622,791 | 88,970 | 7,414 | 244 | 10 |
| 16 | TGPC CS 230-C | Lockport | Niagara | 485,609 | 69,373 | 5,781 | 190 | 8 |
| 17 | DTI Utica Station | Frankfort | Herkimer | 281,369 | 40,196 | 3,350 | 110 | 5 |
| 18 | TGPC CS 233 | York | Livingston | 224,978 | 32,140 | 2,678 | 88 | 4 |
| | | | | 40,192,726 | 5,741,818 | 478,485 | 15,731 | 655 |

2.5d. Releases by NYS DEC Region

The 18 compressor stations analyzed are in 6 of New York State's 9 DEC regions.

Region 9, Western New York, ranked first with 11.6 million pounds (29.1%), closely followed by Region 6, Western Adirondacks/Eastern Lake Ontario (10.7 million pounds or 27%).

Region 4, Capital Region/Northern Catskills, ranked third with 6.7 million pounds (16.8%).

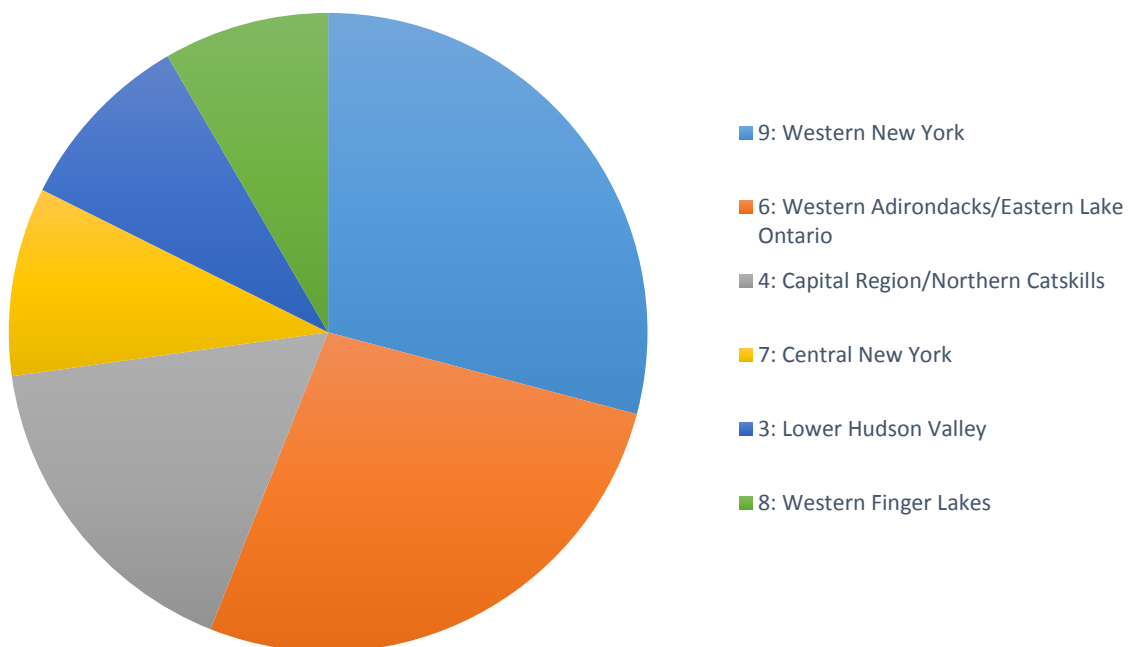
Table 2.5d.

Total Releases by DEC Region (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| NYS DEC Region | | County | | 3 Years: 2008, 11, 14 | | | 7-Year Estimate: 2008-2014 | | |
|----------------|-------------------------------------|------------|------|-----------------------|----|--------------|----------------------------|--------------|-------|
| Rank | Number \ Name | Name | Rank | Fac | Ch | Total Pounds | Average Pounds | Total Pounds | % |
| 1 | 9: Western New York | Allegany | 5 | 2 | 22 | 1,174,939 | 391,646 | 2,741,523 | 6.86 |
| | | Chautauqua | 10 | 2 | 62 | 669,425 | 223,142 | 1,561,991 | 3.91 |
| | | Erie | 2 | 2 | 55 | 2,938,971 | 979,657 | 6,857,598 | 17.15 |
| | | Niagara | 13 | 1 | 27 | 208,118 | 69,373 | 485,610 | 1.21 |
| | | | | 7 | 67 | 4,991,452 | 1,663,817 | 11,646,722 | 29.13 |
| 2 | 6: W. Adirondacks / E. Lake Ontario | Herkimer | 1 | 2 | 67 | 4,605,753 | 1,535,251 | 10,746,758 | 26.88 |
| 3 | 4: Capital Region / N. Catskills | Columbia | 6 | 1 | 27 | 1,025,855 | 341,952 | 2,393,661 | 5.99 |
| | | Schoharie | 3 | 1 | 50 | 1,852,836 | 617,612 | 4,323,285 | 10.81 |
| | | | | 2 | 57 | 2,878,691 | 959,564 | 6,716,946 | 16.80 |
| 4 | 7: Central New York | Onondaga | 4 | 1 | 48 | 1,302,712 | 434,237 | 3,039,661 | 7.60 |
| | | Tompkins | 12 | 1 | 47 | 334,354 | 111,451 | 780,159 | 1.95 |
| | | | | 2 | 68 | 1,637,066 | 545,689 | 3,819,820 | 9.55 |
| 5 | 3: Lower Hudson Valley | Putnam | 9 | 1 | 48 | 723,778 | 241,259 | 1,688,815 | 4.22 |
| | | Rockland | 8 | 1 | 49 | 862,919 | 287,640 | 2,013,478 | 5.04 |
| | | | | 2 | 63 | 1,586,697 | 528,899 | 3,702,293 | 9.26 |
| 6 | 8: Western Finger Lakes | Livingston | 14 | 1 | 27 | 96,419 | 32,140 | 224,978 | 0.56 |
| | | Ontario | 7 | 1 | 9 | 985,026 | 328,342 | 2,298,394 | 5.75 |
| | | Steuben | 11 | 1 | 61 | 355,381 | 118,460 | 829,223 | 2.07 |
| | | | | 3 | 61 | 1,436,827 | 478,942 | 3,352,596 | 8.38 |
| | | | | 18 | 70 | 17,136,487 | 5,712,162 | 39,985,136 | 100% |

NYS Compressor Station NEI Releases by Region: 2008-2014
Total Releases (Pounds)



2.5e. Releases by County

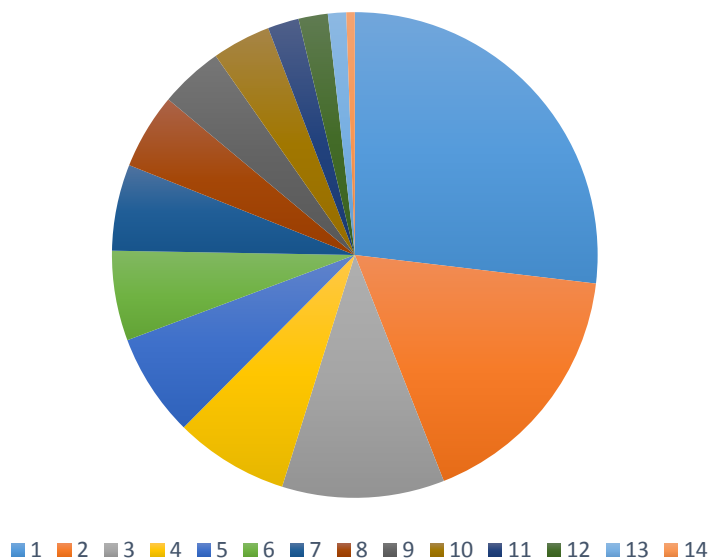
Table 2.5e.

Total Pounds by County (ranked)

NYS Natural Gas Compressor Stations, Reported NEI Emissions: 2008 to 2014

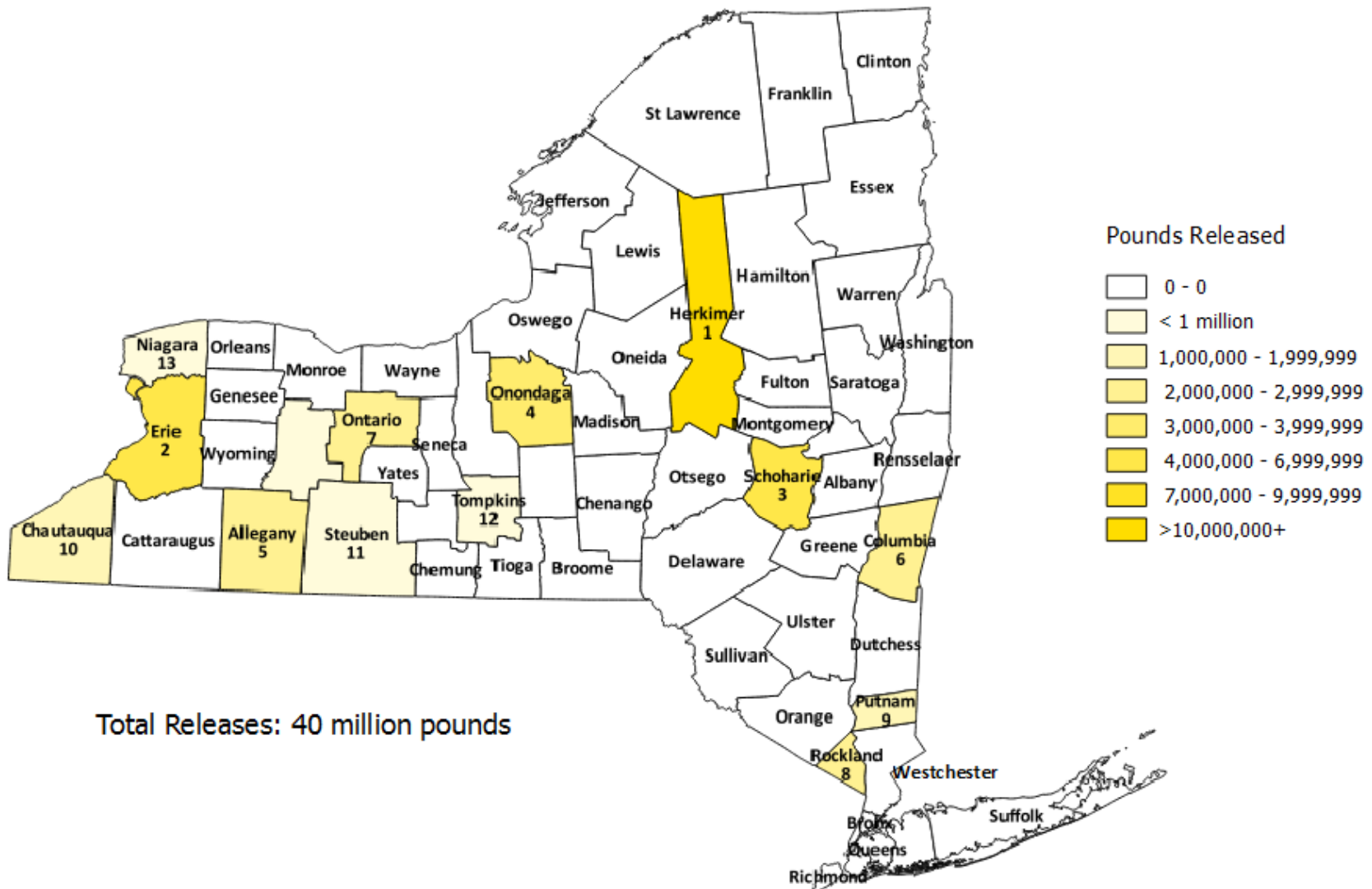
| Rank | Location | | | | Pounds | | | | 7 Year Total | |
|------|------------|-----------------------------------|-----|----|-----------|-----------|-----------|------------|--------------|-------|
| | County | NY DEC Region | Fac | Ch | 2008 | 2011 | 2014 | 3 Yr. Avg. | Pounds | % |
| 1 | Herkimer | 6: W. Adirondacks/E. Lake Ontario | 2 | 67 | 796,186 | 1,937,795 | 1,871,770 | 1,535,251 | 10,746,757 | 26.88 |
| 2 | Erie | 9: Western New York | 2 | 55 | 864,493 | 1,161,927 | 912,550 | 979,656 | 6,857,598 | 17.15 |
| 3 | Schoharie | 4: Capital Region/N. Catskills | 1 | 50 | 712,001 | 569,087 | 571,747 | 617,612 | 4,323,285 | 10.81 |
| 4 | Onondaga | 7: Central New York | 1 | 48 | 297,484 | 574,213 | 431,013 | 434,237 | 3,039,661 | 7.60 |
| 5 | Allegany | 9: Western New York | 2 | 22 | 235,166 | 413,713 | 526,058 | 391,646 | 2,741,523 | 6.86 |
| 6 | Columbia | 4: Capital Region/N. Catskills | 1 | 27 | 288,373 | 260,769 | 476,711 | 341,951 | 2,393,660 | 5.99 |
| 7 | Ontario | 8: Western Finger Lakes | 1 | 9 | 321,292 | 482,042 | 181,690 | 328,342 | 2,298,394 | 5.75 |
| 8 | Rockland | 3: Lower Hudson Valley | 1 | 49 | 244,039 | 268,064 | 350,815 | 287,639 | 2,013,478 | 5.04 |
| 9 | Putnam | 3: Lower Hudson Valley | 1 | 48 | 161,096 | 255,289 | 307,391 | 241,259 | 1,688,814 | 4.22 |
| 10 | Chautauqua | 9: Western New York | 2 | 62 | 144,599 | 468,880 | 55,945 | 223,141 | 1,561,991 | 3.91 |
| 11 | Steuben | 8: Western Finger Lakes | 1 | 61 | 104,802 | 209,129 | 41,449 | 118,460 | 829,223 | 2.07 |
| 12 | Tompkins | 7: Central New York | 1 | 47 | 129,003 | 83,412 | 121,937 | 111,451 | 780,159 | 1.95 |
| 13 | Niagara | 9: Western New York | 1 | 27 | 83,450 | 2,791 | 121,876 | 69,372 | 485,609 | 1.21 |
| 14 | Livingston | 8: Western Finger Lakes | 1 | 27 | 55,594 | 31,315 | 9,509 | 32,139 | 224,978 | 0.56 |
| | | | 18 | | 4,437,578 | 6,718,426 | 5,980,461 | 5,712,156 | 39,985,130 | 100% |

NYS Compressor Station NEI Releases by County: 2008-2014
Total Releases



NYS Natural Gas Compressor Stations: 2008-2014

Total Releases by County



Chapter 3: Health Effects

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3.1. Introduction

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3.1. Total Releases by Chemical

“Epidemiological studies have shown that children's exposure to air pollutants during fetal development and early postnatal life is associated with many types of health problems including abnormal development (low birth weight [LBW], very low birth weight [VLBW], preterm birth [PTB], intrauterine growth restriction [IUGR], congenital defects, and intrauterine and infant mortality), decreased lung growth, increased rates of respiratory tract infections, childhood asthma, behavioral problems, and neurocognitive decrements.” (Wang and Pinkerton 2007).

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3.1.1. Nitrogen oxides

Nitrogen oxides ranked first with 18,082,571 pounds or 45.2% of the state total. All 18 stations reported releases of nitrogen oxides. A criteria air pollutant (CAP), nitrogen oxides are associated with 11 major categories of human disease.

| ICD 10 | | | Sample References | |
|--------|--------|--|--|----|
| Ch | Code | Description | Author | HA |
| 4 | | Endocrine and related | | |
| | E11 | diabetes mellitus | Coogan et al. 2012, Eze et al. 2014 | H |
| | E14 | Type II diabetes | Meo et al. 2015 | H |
| | E30 | pubertal development | Huang et al. 2017 | H |
| 5 | | Mental and behavioral | | |
| | F84 | autism | Suades-González et al. 2015 | H |
| | F90 | ADHD | Fluegge et al. 2017, Varol et al. 2006 | H |
| | F99 | neurodevelopmental disorders | Fluegge 2016 | H |
| 7 | | Eye and adnexa | | |
| | H57 | eye irritation | Ghorani-Azam et al. 2016, U.S. ATSDR ToxFaqs | H |
| 9 | | Circulatory system | | |
| | I99 | cardiovascular disease | Bertoldi et al. 2012 | H |
| 10 | | Respiratory system | | |
| | J34 | mucous membrane irritation | Ghorani-Azam et al. 2016 | H |
| | J40 | bronchitis and bronchiolitis | Esplugues et al. 2011 | H |
| | J45 | asthma | Di Giampaolo et al. 2011 | H |
| | J39 | throat irritation | Ghorani-Azam et al. 2016, U.S. ATSDR ToxFaqs | H |
| | J68 | pneumonia | Esplugues et al. 2011 | H |
| | J81 | pulmonary edema | Ghorani-Azam et al. 2016, U.S. ATSDR ToxFaqs | H |
| | J98 | bronchospasm | Ghorani-Azam et al. 2016 | H |
| | | lung irritation | U.S. ATSDR ToxFaqs | H |
| | J99 | respiratory tract infections | Ghorani-Azam et al. 2016 | H |
| | | pulmonary inflammation | Gilmour 1995 | A |
| | Multi. | lower respiratory tract infections | Esplugues et al. 2011 | H |
| 11 | | Digestive system | | |
| | K35 | appendicitis (unspecified) | Beamish et al. 2011 | H |
| | K50 | Crohn's disease | Kaplan et al. 2010 | H |
| 12 | | Skin and subcutaneous tissue | | |
| | L98 | Skin irritation | U.S. ATSDR | H |
| 14b | | Genitourinary system | | |
| | N46 | spermatogenesis | Renjari et al. 2015 | H |
| | | fertility (affected) | NJHSFS | H |
| 15 | | Pregnancy, childbirth and the puerperium | | |
| | O03 | miscarriage or fetal death | ILO | HA |
| 16 | | Certain conditions originating in the perinatal period | | |
| | P05 | small for gestational age | Malmqvist et al. 2016 | H |
| 18 | | Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified | | |
| | R06 | shortness of breath | U.S. ATSDR ToxFaqs | H |
| | R11 | nausea | U.S. ATSDR ToxFaqs | H |
| | R53 | tiredness | U.S. ATSDR ToxFaqs | H |

3.1.2. Carbon monoxide

Carbon monoxide ranked 2nd with 12.4 million pounds or 30.9% of the state total. All 18 stations reported releases of carbon monoxide. A criteria air pollutant (CAP), environmental exposure to carbon monoxide is associated with 11 major categories of human disease.

| ICD 10 | | | Sample References | |
|--------|--|--|---------------------------------------|----|
| Ch | Code | Description | Author | HA |
| 3 | Blood and | | | |
| | D89.9 | autoimmune (disorders) | Nicholls 2001, Science Daily | H |
| 4 | Endocrine and related | | | |
| | | | | |
| 5 | Mental and behavioral | | | |
| | F03 | hallucinations | Carbon-monoxide-survivor.com | |
| | F32 | Depression | Carbon-monoxide-survivor.com | |
| | F41 | panic attacks | Carbon-monoxide-survivor.com | |
| | F22 | delusions | Carbon-monoxide-survivor.com | |
| 6 | Nervous system | | | |
| | G31.9 | neurodegenerative effects | Nicholls 2001 | H |
| | G80 | cerebral palsy | Alehan et al. 2007 | H |
| | G98 | nervous system (damage) | U.S. NIH ToxTown | H |
| 7 | Eye and adnexa | | | |
| | | | | |
| 8 | Ear and mastoid process | | | |
| | H90 | hearing (loss) | Campo et al. 2013 | H |
| 9 | Circulatory system | | | |
| | | | | |
| 10 | Respiratory system | | | |
| | | | | |
| 11 | Digestive system | | | |
| | K63 | enteric disease | Beamish et al. 2011 | H |
| 12 | Skin and subcutaneous tissue | | | |
| | | | | |
| 14b | Genitourinary system | | | |
| | N46 | sterility (men) | ILO 1996 | H |
| | N99 | Reduced fertility or sterility | ILO 1996 | H |
| 15 | Pregnancy, childbirth and the puerperium | | | |
| | | | | |
| 16 | Certain conditions originating in the perinatal period | | | |
| | | | | |
| 17 | Q00-Q99 Congenital malformations, deformations and chromosomal abnormalities | | | |
| | Q00 | anencephaly | Stanford Medicine News Center | H |
| | Q05 | spina bifida | Stanford Medicine News Center | H |
| | Q07 | neural tube defects | Padula et al. 2013 | H |
| | Q23 | Tetralogy of Fallot | Gilboa et al. 2005 | H |
| | Q24 | congenital malformation of heart | Dadvand et al. 2011, Ritz et al. 2002 | H |
| | Q35 | cleft palate | Zhu et al. 2015 | H |
| | Q89 | Human developmental toxin (recognized) | CA P65 | H |
| | Q89 | ILO: Animal teratogen (recognized) | ILO | A |
| | Q89 | teratogen (humans) | Norman & Halton 1990. | H |
| 18 | R00-R99 Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified | | | |
| | R07 | chest pain | U.S. NIH ToxTown | H |
| | R19 | low birth weight | Ritz and Yu 1993 | H |
| | R41 | mental confusion | Carbon-monoxide-survivor.com | H |
| | R45 | agitation | Carbon-monoxide-survivor.com | H |
| | R61 | sweating | U.S. NIH ToxTown | H |
| | R68 | decreased libido | Carbon-monoxide-survivor.com | H |

3.1.3. Volatile organic compounds

| ICD 10 | | | Sample References | |
|--------|------|---|-------------------|----|
| Ch | Code | Description | Author | HA |
| 4 | | Endocrine and related | | |
| | | | | |
| | | | | |
| 5 | | Mental and behavioral | | |
| | | | | |
| | | | | |
| 7 | | Eye and adnexa | | |
| | | | | |
| 9 | | Circulatory system | | |
| | | | | |
| 10 | | Respiratory system | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| 11 | | Digestive system | | |
| | | | | |
| 12 | | Skin and subcutaneous tissue | | |
| | | | | |
| 14b | | Genitourinary system | | |
| | | | | |
| 15 | | Pregnancy, childbirth and the puerperium | | |
| | | | | |
| 16 | | Certain conditions originating in the perinatal period | | |
| | | | | |
| 18 | | Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified | | |
| | | | | |
| | | | | |

3.1.4. Formaldehyde

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3.1.5 PM10 Primary (Filt + Cond)

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3.1.6 PM 2.5 Primary (Filt + Cond)

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3.1.7 PM Condensable

DRAFT

3.1.8 Sulfur dioxide

DRAFT

3.1.9 Acetaldehyde

DRAFT

3.1.10 Acrolein

DRAFT

3.1.11 Benzene

DRAFT

3.1.12 Methanol

DRAFT

3.1.13 Toluene

DRAFT

3.1.14 Hexane, n-

DRAFT

3.1.15 Xylene (mixed isomers)

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Table 2.5e.

Chemicals and Health Effects Ranked by Total Pounds

NYS Natural Gas Compressor Stations, Reported NEI Emissions: 2008 to 2014

| # | Chemical | Pounds | % | Health Effects | | | | | | | | | | | | | | | | | | | |
|----|------------------------------|------------|-------|----------------|-----------------------|---------------------|---------------------|----------------|----------------|-------------------------|-------------|-------------|-----------|-----------------------|-----------------|----------------|------------------------|---|--|------------------|---|--|-----------------------------------|
| | | | | Neoplasms | Blood & immune system | Endocrine & related | Mental & Behavioral | Nervous system | Eye and adnexa | Ear and mastoid process | Circulatory | Respiratory | Digestive | Skin and subcutaneous | Musculoskeletal | Genitourinary` | Genitourinary: Urinary | Genitourinary: Pelvis, genitals and breasts | Pregnancy, childbirth and the puerperium | Perinatal period | Congenital malformations & chrom. abnormalities | Symptoms, signs, abnormal clinical & lab. findings | Injury, poisoning external causes |
| | | | | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 14a | 14b | 15 | 16 | 17 | 18 | 19 |
| | | | | 59 | 41 | 52 | 35 | 42 | 44 | 16 | 42 | 51 | 49 | 52 | 6 | 46 | 37 | 36 | 12 | 26 | 57 | 48 | 12 |
| 1 | Nitrogen oxides | 18,082,571 | 45.22 | | | ✓ | ✓ | | ✓ | | ✓ | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | ✓ | ✓ | |
| 2 | Carbon monoxide | 12,359,731 | 30.91 | | ✓ | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | | | ✓ | | ✓ | | | ✓ | ✓ | |
| 3 | Volatile organic compounds | 4,920,396 | 12.31 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | | ✓ | ✓ | |
| 4 | Formaldehyde | 1,309,336 | 3.27 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 5 | PM10 Primary (Filt + Cond) | 1,259,744 | 3.15 | ✓ | | | ✓ | | | | ✓ | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | ✓ | ✓ | |
| 6 | PM 2.5 Primary (Filt + Cond) | 1,106,198 | 2.77 | ✓ | | | ✓ | | | | ✓ | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | ✓ | ✓ | |
| 7 | PM Condensable | 540,267 | 1.35 | ✓ | | ✓ | ✓ | | | | | | | ✓ | | ✓ | | ✓ | | ✓ | ✓ | | |
| 8 | Sulfur dioxide | 186,778 | 0.47 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | ✓ | ✓ | ✓ | ✓ |
| 9 | Acetaldehyde | 65,969 | 0.16 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 10 | Acrolein | 52,723 | 0.13 | ✓ | | | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | | | | | ✓ | | ✓ | ✓ | ✓ |
| 11 | Benzene | 21,241 | 0.05 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| 12 | Methanol | 19,333 | 0.05 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | |
| 13 | Toluene | 19,308 | 0.05 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| 14 | Hexane | 12,184 | 0.03 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | |
| 15 | Xylene (mixed isomers) | 8,394 | 0.02 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| 16 | 1,3-Butadiene | 4,719 | 0.01 | ✓ | ✓ | ✓ | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | | ✓ | ✓ | |
| 17 | 2,2,4-Trimethylpentane | 4,445 | 0.01 | | | | | ✓ | | | | | | | ✓ | | ✓ | | | | | ✓ | |
| 18 | Ethyl benzene | 2,794 | 0.01 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | |
| 19 | Ammonia | 1,573 | 0.00 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | | | | | ✓ | ✓ |
| 20 | Phenol | 706 | 0.00 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ |
| 21 | Naphthalene | 696 | 0.00 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | | ✓ | | ✓ | ✓ | |
| 22 | Nickel | 692 | 0.00 | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | |
| 23 | Biphenyl | 690 | 0.00 | ✓ | | ✓ | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | | | | ✓ | ✓ | |
| 24 | Methane dichloride | 629 | 0.00 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 25 | Propylene oxide | 615 | 0.00 | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ |
| 26 | Manganese | 350 | 0.00 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | |
| 27 | Ethylene dibromide | 347 | 0.00 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | | ✓ | ✓ | |
| 28 | 1,1,2,2-Tetrachloroethane | 309 | 0.00 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | | | | ✓ | ✓ | |
| 29 | Carbon tetrachloride | 282 | 0.00 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| 30 | 1,1,2-Trichloroethane | 247 | 0.00 | ✓ | ✓ | | ✓ | ✓ | | | ✓ | | | ✓ | | ✓ | ✓ | | | | ✓ | | |
| 31 | Styrene | 234 | 0.00 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |

| # | Chemical | Pounds | % | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 14a | 14b | 15 | 16 | 17 | 18 | 19 |
|----|--------------------------------|--------|------|-----------|-----------------------|---------------------|---------------------|----------------|----------------|-------------------------|-------------|-------------|-----------|-----------------------|-----------------|----------------|------------------------|---|--|------------------|---|--|-------------------------------------|
| | | | | Neoplasms | Blood & immune system | Endocrine & related | Mental & Behavioral | Nervous system | Eye and adnexa | Ear and mastoid process | Circulatory | Respiratory | Digestive | Skin and subcutaneous | Musculoskeletal | Genitourinary` | Genitourinary: Urinary | Genitourinary: Pelvis, genitals and breasts | Pregnancy, childbirth and the puerperium | Perinatal period | Congenital malformations & chrom. abnormalities | Symptoms, signs, abnormal clinical & lab. findings | Injury, poisoning . external causes |
| 32 | Chloroform | 193 | 0.00 | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | √ | √ | √ | | √ | √ | √ | |
| 33 | 2-Methylnaphthalene | 191 | 0.00 | √ | √ | | √ | | √ | | | √ | | | | | | | | | | √ | |
| 34 | Chlorobenzene | 172 | 0.00 | √ | √ | √ | √ | √ | √ | | √ | √ | √ | √ | √ | √ | √ | | | | √ | √ | |
| 35 | Propylene dichloride | 164 | 0.00 | √ | √ | | | √ | | | | √ | √ | | | √ | √ | | | | √ | √ | |
| 36 | 1,3-Dichloropropene | 161 | 0.00 | √ | √ | | | √ | √ | | | √ | √ | √ | | √ | √ | √ | | √ | √ | √ | |
| 37 | Ethylene dichloride | 151 | 0.00 | √ | √ | √ | √ | √ | √ | | √ | √ | √ | √ | | √ | √ | √ | | | √ | √ | |
| 38 | Ethylidene dichloride | 144 | 0.00 | √ | | | | √ | √ | | √ | √ | √ | | | √ | √ | √ | | | | | |
| 39 | Vinyl chloride | 107 | 0.00 | √ | √ | | √ | √ | √ | √ | √ | √ | √ | √ | | √ | | √ | | | √ | √ | |
| 40 | Mercury | 70 | 0.00 | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | √ | √ | √ | √ | | √ | √ | |
| 41 | Chromium III | 56 | 0.00 | | | √ | | | √ | | | √ | √ | √ | | | | | | | | √ | |
| 42 | Phenanthrene | 48 | 0.00 | √ | | √ | | | √ | | | √ | √ | √ | | | | | | √ | √ | √ | √ |
| 43 | PAHs Total | 35 | 0.00 | √ | | | | | | | | | | | | | | | | | | | |
| 44 | Cadmium | 30 | 0.00 | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | √ | √ | √ | | √ | √ | √ | √ |
| 45 | Fluorene | 28 | 0.00 | | | √ | | | | | | | √ | | | | | | | | √ | | |
| 46 | Benz[a]anthracene | 19 | 0.00 | √ | | √ | | | | | | | | | | | | | | | √ | | |
| 47 | Benzo(j,k)fluorene | 11 | 0.00 | | | √ | | | | | | | √ | | | | | | | | √ | | |
| 48 | Anthracene | 10 | 0.00 | √ | | √ | | | √ | | | √ | √ | √ | | | | | | | √ | √ | √ |
| 49 | Perchloroethylene | 9 | 0.00 | √ | √ | √ | √ | √ | √ | | √ | √ | √ | √ | | √ | √ | √ | √ | √ | √ | √ | |
| 50 | Acenaphthene | 8 | 0.00 | | | | | | | | | | √ | | | | | | | √ | | | |
| 51 | Pyrene | 7 | 0.00 | | | √ | | √ | | | | | | √ | | | | | | | √ | | |
| 52 | Ethyl chloride | 6 | 0.00 | √ | √ | | √ | √ | √ | | √ | √ | √ | √ | √ | √ | √ | √ | | | √ | √ | |
| 53 | Acenaphthylene | 5 | 0.00 | | | √ | | | | | | √ | | | | | | | | | | | |
| 54 | Chrysene | 4 | 0.00 | √ | | √ | | | | | | | | | | | | | | | √ | | |
| 55 | Chromium (VI) | 2 | 0.00 | √ | | √ | | | √ | | | √ | √ | √ | | | | | | | | √ | |
| 56 | Benzo[g,h,i]perylene | 2 | 0.00 | √ | √ | | | | | | | | √ | | | | | | | | √ | | |
| 57 | Benzo[b]fluoranthene | 1 | 0.00 | √ | | √ | | | | | | | | | | | | | | | √ | | |
| 58 | Lead | 1 | 0.00 | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | | √ | √ | √ | | √ | √ | √ | √ |
| 59 | Benzo[e]pyrene | 0.09 | 0.00 | | | √ | | | | | | | | | | | | | | | √ | | |
| 60 | Arsenic | 0.06 | 0.00 | √ | √ | √ | | √ | | | √ | √ | √ | √ | | √ | √ | | | √ | √ | √ | |
| 61 | Cobalt | 0.03 | 0.00 | √ | √ | √ | | √ | √ | √ | √ | √ | √ | √ | | √ | √ | √ | | | √ | √ | |
| 62 | Indeno[1,2,3-cd]pyrene | 0.02 | 0.00 | √ | | √ | | | | | | | | | | | | | | | √ | | |
| 63 | Benzo[a]pyrene | 0.01 | 0.00 | √ | √ | √ | | | | | | √ | √ | √ | | √ | | | | | √ | | |
| 64 | Selenium | 0.01 | 0.00 | √ | √ | √ | √ | √ | √ | | √ | √ | √ | √ | √ | √ | √ | √ | | | √ | √ | |
| 65 | Perylene | 0.0039 | 0.00 | | | √ | | | | | | | | | | | | | | | | | |
| 66 | Beryllium | 0.0034 | 0.00 | √ | | | √ | | √ | | √ | √ | √ | | | | | | | | √ | √ | |
| 67 | 7,12-Dimethylbenz[a]anthracene | 0.0033 | 0.00 | √ | √ | √ | | | | | | | | √ | | √ | | √ | | | | | |
| 68 | Benzo[k]fluoranthene | 0.0029 | 0.00 | √ | | √ | | | | | | | | | | | | | | | √ | | |

| # | Chemical | Pounds | % | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 14a | 14b | 15 | 16 | 17 | 18 | 19 |
|----|-----------------------|--------|------|-----------|-----------------------|---------------------|---------------------|----------------|----------------|-------------------------|-------------|-------------|-----------|-----------------------|-----------------|----------------|------------------------|---|--|------------------|---|--|---|
| | | | | Neoplasms | Blood & immune system | Endocrine & related | Mental & Behavioral | Nervous system | Eye and adnexa | Ear and mastoid process | Circulatory | Respiratory | Digestive | Skin and subcutaneous | Musculoskeletal | Genitourinary' | Genitourinary: Urinary | Genitourinary: Pelvis, genitals and breasts | Pregnancy, childbirth and the puerperium | Perinatal period | Congenital malformations & chrom. abnormalities | Symptoms, signs, abnormal clinical & lab. findings | Injury, poisoning . . . external causes |
| 69 | 3-Methylcholanthrene | 0.0003 | 0.00 | √ | | √ | | | | | √ | | | √ | | | | | | | | | |
| 70 | Dibenz[a,h]anthracene | 0.0001 | 0.00 | √ | | √ | | | | | | | | √ | | | | | | | √ | | |

3.2. Neoplasms (C00-D48)

3.2.1. Carcinogens by Evidence of Carcinogenicity

Fifty-nine of the 70 chemicals released by NYS natural gas compressor stations are associated with neoplastic diseases.

All 18 stations had carcinogenic releases. These totaled an estimated 9.5 million pounds from 2008 to 2014--an annual average of 1.4 million pounds.

Chemicals associated with cancer represented 23.7% of all compressor station releases.

Of the 59 chemicals linked to cancer, 22 chemicals are categorized as “known” human carcinogens by one or more authoritative sources:

1. International Agency for Research on Cancer (IARC) -- the specialized cancer agency of the World Health Organization (WHO),
2. U.S. National Toxicology Program (NTP) -- National Institute of Environmental Health Sciences, National Institutes of Health,
3. U.S. Environmental Protection Agency (EPA),
4. U.S. National Institute for Occupational Safety and Health (NIOSH),
5. U.S. Occupational Safety and Health Administration (OSHA), and
6. State of California, Office of Environmental Health Hazard Assessment (CA/OEHHA) -- part of the California Environmental Protection Agency (Cal/EPA).

Known human carcinogens account for 83% of total carcinogens.

Table 3.2.1a.

Carcinogens by Evidence of Carcinogenicity

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Evidence of Carcinogenicity | | Location | | | | 7 Years (estimate) | | |
|-----------------------------|--|-----------|-----------|-----------|----------|-----------------------|------------------|-------------|
| | | Ch | Fac | Cn | DEC | Average Annual Pounds | Total Pounds | % |
| 1 | Authority: known human carcinogen | 23 | 18 | 14 | 6 | 1,129,164 | 7,904,153 | 82.87 |
| 2 | Authority: probable human carcinogen | 2 | 18 | 14 | 6 | 105 | 738 | .01 |
| 3 | Authority: possible human carcinogen | 18 | 18 | 14 | 6 | 13,020 | 91,140 | .96 |
| 4 | Peer-reviewed: positive human and animal evidence of carcinogenicity | 17 | 17 | 13 | 6 | 39,004 | 273,032 | 2.86 |
| 5 | Peer-reviewed: positive human evidence of carcinogenicity | 14 | 14 | 12 | 6 | 181,162 | 1,268,140 | 13.30 |
| 6 | Peer-reviewed: positive animal evidence of carcinogenicity | 3 | 11 | 9 | 6 | 152 | 1,069 | .01 |
| Total | | 59 | 18 | 14 | 6 | 1,362,607 | 9,538,272 | 100% |

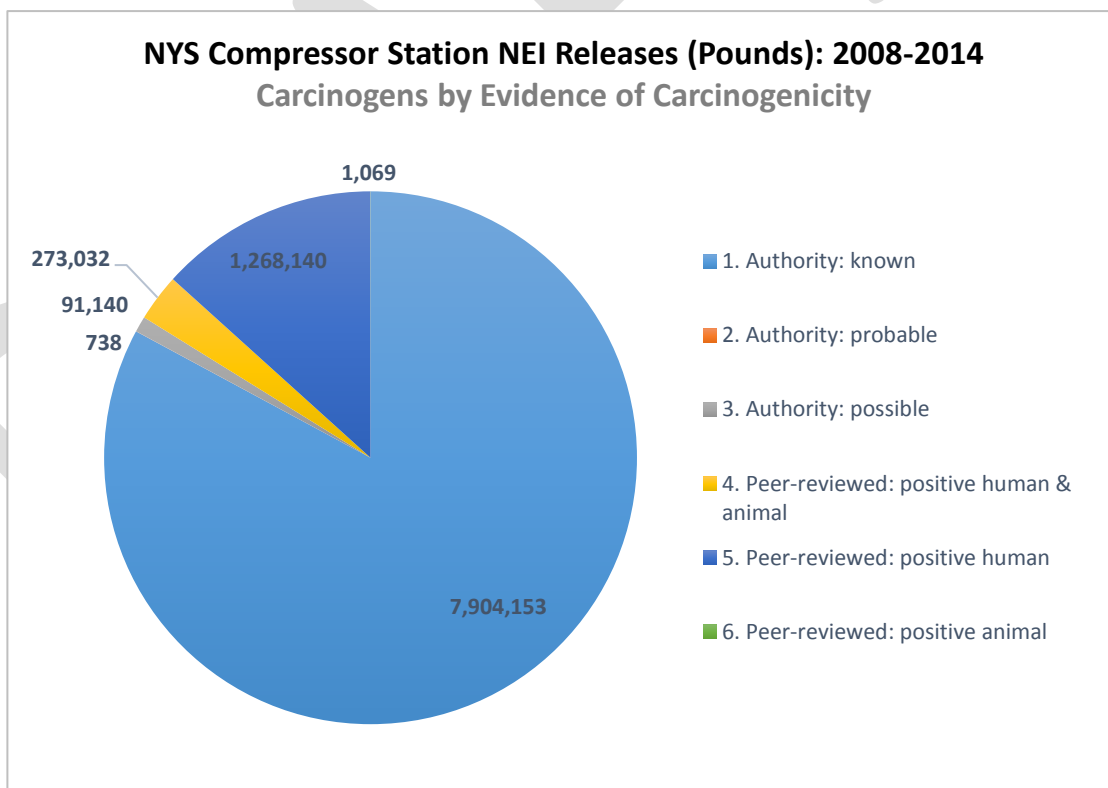


Table 3.2.1b.

Neoplastic Diseases by Chemical (Top 20 Carcinogens)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

TBL32_Hz

| | | | Authors' Classification | IARC | IARC: Evidence, Human | IARC: Evidence, Animal | U.S. NTP | U.S. NIOSH | U.S. EPA | EPA: Evidence, Human | EPA: Evidence, Animal | U.S. OHA | California Proposition 65 | | | | Stomach | | | Anus | Liver and intrahepatic bile ducts | | | | | Nasal cavity | | | Trachea | Bronchus, lung | Skin | Connective and soft tissue | Breast, female | Uterus | Prostate | Kidney | Bladder | Adrenal gland | Leukemia and/or Lymphoma | | Lymphoma | Non-Hodgkin's | | | Leukemia: mononuclear cell | Chronic lymphocytic leukemia | Myeloid leukemia |
|------|-----------------------------|-----------|-------------------------|------|-----------------------|------------------------|----------|------------|----------|----------------------|-----------------------|----------|---------------------------|-----|-----|-----|---------|-----|-----|------|-----------------------------------|-----|-----|-----|-----|--------------|-----|-----|---------|----------------|------|----------------------------|----------------|--------|----------|--------|---------|---------------|--------------------------|-------|----------|---------------|--|--|----------------------------|------------------------------|------------------|
| Rank | Name | Pounds | | I | | | | | | | | | | C14 | C15 | C16 | C18 | C21 | C22 | C23 | C25 | C30 | C32 | C33 | C34 | C44 | C49 | C50 | C55 | C61 | C64 | C67 | C74 | | Leu | | C85 | C90.0 | C91.0 | C91.1 | C92.0 | | | | | | |
| 1 | Volatile organic compounds | 4,920,395 | 1-K | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Formaldehyde | 1,309,335 | 1-K | 1 | S | S | K | P | B1 | | | R | K | | | | | S | | | | L | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | PM10 Primary (Filt + Cond) | 1,259,744 | 5-H | | | | | | | | | | MC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | PM2.5 Primary (Filt + Cond) | 1,106,197 | 1-K | 1 | | | | | | | | | MC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | PM Condensable | 540,267 | 1-K | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Sulfur dioxide | 186,778 | 5-H | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Remaining PM Fine | 98,182 | 1-K | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | Acetaldehyde | 65,969 | 1-K | 2B | I | S | R | P | B2 | | | | K | | | | | Sa | | | | | Sa | | Sa | | | | | | | | | | | | | | | | | | | | | | |
| 9 | Acrolein | 52,723 | 4-H-A | 3 | I | I | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | Benzene | 21,240 | 1-K | 1 | S | S | K | P | K/L | | | R | K | | | | | | | | | | | | | | | | | | | | S | | | L | L | L | L | L | S | | | | | | |
| 11 | Methanol | 19,333 | 3-Ps | | | | | | | ND | ND | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | Toluene | 19,308 | 4-H-A | 3 | I | Su | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | Hexane | 12,184 | 6-A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | Xylenes (mixed isomers) | 8,394 | 4-H-A | 3 | I | I | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | 1,3-Butadiene | 4,718 | 1-K | 1 | S | S | K | P | K | | | R | K | | | | | | | | | | | | | | | | | | | | S | | | | | | | | | | | | | | |
| 16 | Ethyl benzene | 2,794 | 1-K | 2B | I | S | | | D | | | | K | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | Ammonia | 1,573 | 4-H-A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | Phenol | 706 | 6-A | 3 | I | I | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19 | Naphthalene | 696 | | 2B | I | S | R | | C | | | | K | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | Nickel | 692 | | 2B | S | S | R | P | A | | | | K | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 21 | Biphenyl | 690 | 2-Pr | | | | | | SEv | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | Methylene chloride | 629 | 1-K | 2A | I | S | R | P | L | | | R | K | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23 | Propylene oxide | 615 | | 2B | I | S | R | P | B2 | | | | K | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 25 | Ethylene dibromide | 347 | | 2A | I | S | R | P | L | | | | K | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

3.2a. Releases by Chemical

Volatile organic compounds (VOCs) as a group were responsible for 51.6% of all statewide carcinogenic releases, slightly more than 4.9 million pounds. In addition to VOCs as a group, NEI also identifies specific VOCs. Individual VOCs have different levels of evidence of human carcinogenicity. Formaldehyde, which ranks 2nd, is classified by IARC as a known human carcinogen. Acetaldehyde, which ranks 7th, is classified as a possible human carcinogen by IARC. Methanol, which ranks 10th, is classified by EU as having limited evidence of human carcinogenicity (R40). There is both animal and human evidence for the carcinogenicity of acrolein, but it has not been classified by IARC because of the limited amount of evidence available. Benzene, which ranks 9th, is universally considered a known human carcinogen (IARC, NTP, EPA, OSHA, NIOSH, CA/OEHHA). VOCs as a group undoubtedly contain a mixture of individuals VOCs, some of which are classified as known, probable or possible human carcinogens, as well as some that have not been classified by an authoritative agency for various reasons including the lack of available evidence upon which to make an assessment. While not every VOC is a carcinogen, many are. The emission reporting category VOCs is, in our opinion, reflective of known human carcinogenic activity and we have included it as a known human carcinogen in this report. Formaldehyde ranked second with 1,309,335 pounds (13.7%), followed by PM10 with 1,259,744 pounds (13.2%). These three chemicals were responsible for 78.5% of all carcinogens released by the state's natural gas compressor stations. The top 10 chemicals accounted for 99.4% of all carcinogenic releases.

Table 3.2a.

Neoplastic Diseases by Chemical (Top 20 Carcinogens)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Chemical | | Location | | | 3 Years | 7 Year Estimate: 2008 to 2014 | | |
|----------|-----------------------------|----------|------|-------|-----------|-------------------------------|-----------|-------|
| Rank | Name | Fac's | Cn's | Reg's | Pounds | Average | Pounds | % |
| 1 | Volatile organic compounds | 18 | 14 | 6 | 2,108,741 | 702,913 | 4,920,395 | 51.59 |
| 2 | Formaldehyde | 18 | 14 | 6 | 561,143 | 187,047 | 1,309,335 | 13.73 |
| 3 | PM10 Primary (Filt + Cond) | 18 | 14 | 6 | 539,890 | 179,963 | 1,259,744 | 13.21 |
| 4 | PM2.5 Primary (Filt + Cond) | 18 | 14 | 6 | 474,084 | 158,028 | 1,106,197 | 11.60 |
| 5 | PM Condensable | 18 | 14 | 6 | 231,543 | 77,181 | 540,267 | 5.66 |
| 6 | Sulfur Dioxide | 18 | 14 | 6 | 80,047 | 26,682 | 186,778 | 1.96 |
| 7 | Acetaldehyde | 14 | 13 | 6 | 28,272 | 9,424 | 65,969 | 0.69 |
| 8 | Acrolein | 14 | 13 | 6 | 22,595 | 7,531 | 52,723 | 0.55 |
| 9 | Benzene | 16 | 13 | 6 | 9,103 | 3,034 | 21,240 | 0.22 |
| 10 | Methanol | 8 | 7 | 6 | 8,285 | 2,761 | 19,333 | 0.20 |
| 11 | Toluene | 16 | 13 | 6 | 8,274 | 2,758 | 19,307 | 0.20 |
| 12 | Hexane | 13 | 10 | 6 | 5,221 | 1,740 | 12,183 | 0.13 |
| 13 | Xylenes (Mixed Isomers) | 15 | 13 | 6 | 3,597 | 1,199 | 8,394 | 0.09 |
| 14 | 1,3-Butadiene | 14 | 13 | 6 | 2,022 | 674 | 4,718 | 0.05 |
| 15 | Ethyl Benzene | 15 | 13 | 6 | 1,197 | 399 | 2,794 | 0.03 |
| 16 | Ammonia | 8 | 7 | 5 | 674 | 224 | 1,573 | 0.02 |
| 17 | Phenol | 11 | 10 | 6 | 302 | 100 | 706 | 0.01 |
| 18 | Naphthalene | 15 | 13 | 6 | 298 | 99 | 696 | 0.01 |
| 19 | Nickel | 11 | 11 | 6 | 296 | 98 | 691 | 0.01 |
| 20 | Biphenyl | 6 | 6 | 5 | 295 | 98 | 690 | 0.01 |
| | | 18 | 14 | 6 | 4,085,879 | 1,361,953 | 9,533,733 | 99.97 |

3.2b. Releases by ICD Category

Neoplasms are subdivided into 3 major groups: malignant neoplasms (C00-C97), in situ neoplasms (D00-D09), benign neoplasms (D10-D36), and neoplasms of uncertain or unknown behavior (D37-D48). Chemicals released by natural gas compressor stations in NYS are positively associated with all four. It should be remembered, that a single chemical can be associated with more than one category of disease.

Malignant neoplasms (C00-C97)

Malignant neoplasms are sub-divided into 14 groups--the primary consideration for categorization being the effected organ or organ system. Fifty-six chemicals released by NYS compressor stations (2008-2014) are associated with malignant neoplasms.

All 18 NYS compressor stations had reported releases of chemicals associated with malignant neoplasms.

Four of the top 5 polluters were facilities operated by the Tennessee Gas Pipeline Company. TGPC's Compressor Station 245 in Winfield ranked first with 1.7 million pounds or 18% of the total, followed by the company compressor in Carlisle (1.4 million pounds or 14.2%) and by its LaFayette facility (1.14 million pounds or 11.9%). These three sites were responsible for 4.2 million pounds or 44% of all statewide releases. The top 5 sites were responsible for 5.9 million pounds or slightly less than two-thirds (62.1%) of the state total. The facility average was 532,453 pounds. (Table 2c)

1. Lip, oral cavity and pharynx (C10-C14)

Fourteen chemicals released by NYS natural gas compressor stations are associated with malignant neoplasms of the lip, oral cavity and pharynx. Specific organs affected include: lips (C00), tongue (C02), buccal, mouth, and oral cavity (C06), salivary gland (C08), nasopharynx (C11), hypopharyngeal (C13), and oral cavity and pharynx (C14).

Four of the top 5 polluters were facilities operated by the Tennessee Gas Pipeline Company. TGPC's Compressor Station 245 in Winfield ranked first with 226,703 pounds or 15.7% of the total, followed by the company's compressor in LaFayette (186,512 pounds or 13%) and its Carlisle facility (159,281 pounds or 11.1%). These three sites were responsible for 572,496 pounds or 40% of all statewide releases. The top 5 sites were responsible for 852,720 pounds or more than one-half (59.2%) of the state total. The facility average was 80,029 pounds. (Table 2c.1)

2. Digestive organs (C15-C26)

Thirty-eight chemicals released by NYS natural gas compressor stations are associated with digestive system malignancies. Specific organs affected include: esophagus (C15), stomach (C16), duodenum, small intestine (C17), colon (C18), rectum (C20), anus (C21), liver (C22), biliary tract (C24), pancreas (C25), and spleen (C26).

Four of the top 5 polluters were facilities operated by the Tennessee Gas Pipeline Company. TGPC's Compressor Station 245 in Winfield ranked first with 187,951 pounds or 15.6% of the total, followed by the company's station in LaFayette (187,951 pounds or 12.9%) and its Carlisle facility (160,478 pounds or 11%). These three sites were responsible for 576,136 pounds or 39.4% of all statewide releases. The top 5 sites were responsible for 861,765 pounds or more than one-half (58.9%) of the state total. The facility average was 81,250 pounds. (Table 2c.2)

3. Respiratory system and intrathoracic organs (C30-C39)

Thirty-eight chemicals released by NYS natural gas compressor stations are associated with respiratory system and intrathoracic organ malignancies. Specific organs affected include: nasal cavity, nasal mucosa and paranasal sinus (C30), larynx, throat and trachea (C32), bronchus and lung (C34), cardiac and heart (C38), and respiratory tract (C39).

Four of the top 5 polluters were facilities operated by the Tennessee Gas Pipeline Company. TGPC's Compressor Station 245 in Winfield ranked first with 1.7 million pounds or 18.1% of the total, followed by the company's station in Carlisle (1.3 million pounds or 14.2%) and its LaFayette facility (1.1 million pounds or 11.9%). These three sites were responsible for 4.1 million pounds or 44.2% of all statewide releases. The top 5 sites were responsible for 5.8 million pounds or slightly less than two-thirds (62.1%) of the state total. The facility average was 520,308 pounds. (Table 2c.3)

4. Bone and articular cartilage (C40-C41)

Thirty-five chemicals released by NYS natural gas compressor stations are associated with bone and articular cartilage malignancies, specifically, bone carcinoma and osteosarcoma subcutaneous tissue fibrosarcoma (C41).

Four of the top 5 polluters were facilities operated by the Tennessee Gas Pipeline Company. TGPC's Compressor Station 245 in Winfield ranked first with 1.6 million pounds or 18.4% of the total, followed by the company's station in Carlisle (1.2 million pounds or 14.1%) and its LaFayette facility (1 million pounds or 12%). These three sites were responsible for 3.9 million pounds or 44.5% of all statewide releases. The top 5 sites were responsible for 5.4 million pounds or slightly less than two-thirds (62.1%) of the state total. The facility average was 487,068 pounds. (Table 2c.4)

5. Skin (C43-C44)

Fourteen chemicals released by NYS natural gas compressor stations are associated with skin carcinomas (C44).

TGPC's Compressor Station 229 in Eden ranked first with 13,750 pounds or slightly more than half (51.5%) of the total, followed by AG Stony Point compressor (4,553 pounds or 17.1%) and DTI's Woodhull Station (2,883 pounds or 10.8%). These three sites were responsible for 21,187 pounds or more than three-fourths (79.4%) of all statewide releases. The top 5 sites were responsible for 24,199 pounds or 90.1% the state total. The facility average was 1,483 pounds. (Table 2c.5)

6. Connective and soft tissue (C45-C49)

Seventeen chemicals released by NYS natural gas compressor stations are associated with connective and soft tissue malignancies, specifically, peritoneal cavity carcinoma and peritoneum mesothelioma (C48), and blood vessel angiosarcoma, carcinoma and hemangiosarcoma, connective tissue carcinoma and sarcoma, heart hemangiosarcoma, liver hemangiosarcoma, and muscle carcinoma (C49).

AG Stony Point Compressor Station ranked first with 7.516 pounds or 27.5% the total, followed by TGPC's compressor in Eden (6,843 pounds or 25%) and AG's Southeast Station (4,304 pounds or 16%). These three sites were responsible for 18,663 pounds or slightly more than two-thirds (68.3%) of all statewide releases. The top 5 sites were

responsible for 22,680 pounds or 83% the state total. The facility average was 1,519 pounds. (Table 2c.6)

7. Breast and female genital organs (C50-C58)

Twenty-five chemicals released by NYS natural gas compressor stations are associated with breast and female genital organ malignancies. Specific organs affected include: breast adenocarcinoma, carcinoma and carcinosarcoma (C50), cervical carcinoma (C53), carcinoma of the uterus (C55), and ovarian carcinoma and granulosa cell carcinoma (C56).

The top 5 polluters were facilities operated by the Tennessee Gas Pipeline Company. TGPC's Compressor Station 245 in Winfield ranked first with 766,684 pounds or 17.7% of the total, followed by the company's station in Carlisle (648,570 pounds or 15%) and its Eden facility (529,510 pounds or 12.2%). These three sites were responsible for 1.9 million pounds or 45% of all statewide releases. The top 5 sites were responsible for 2.8 million pounds or slightly less than two-thirds (63.5) of the state total. The facility average was 240,897 pounds. (Table 2c.7)

8. Male genital organs (C60-C63)

Thirteen chemicals released by NYS natural gas compressor stations are associated with male genital organ malignancies, specifically, prostate carcinomas (C61) and testes carcinomas (C62).

Four of the top 6 polluters were facilities operated by the Tennessee Gas Pipeline Company. TGPC's Compressor Station 245 in Winfield ranked first with 222,045 pounds or 15.9% of the total, followed by NFGSC's station in Concord (188,88 pounds or 13.5%) and TGPC's LaFayette facility (179,381 pounds or 12.6%). These three sites were responsible for 590,314 pounds or 42.2% of all statewide releases. The top 5 sites were responsible for 866,213 pounds or slightly less than two-thirds (61.9%) of the state total. The facility average was 77,773 pounds. (Table 2c.8)

9. Urinary organs (C64-C68)

Twenty-five chemicals released by NYS natural gas compressor stations are associated with urinary tract malignancies, specifically, kidney carcinoma, cortical adenocarcinoma, renal cell carcinoma (C64), urinary bladder carcinoma and transitional cell carcinoma (C67), and urogenital carcinomas (C68).

The top 4 polluters were facilities operated by the Tennessee Gas Pipeline Company. TGPC's Compressor Station 245 in Winfield ranked first with 222,047 pounds or 15.8% of the total, followed by the company's station in LaFayette (186,990 pounds or 13%) and its Carlisle facility (159,689 pounds or 11.1%). These three sites were responsible for 575,865 pounds or 39% of all statewide releases. The top 5 sites were responsible for 862,150 pounds or 59% of the state total. The facility average was 80,063 pounds. (Table 2c.9)

10. Malignant neoplasms: Eye, brain and central nervous system (C69-C72)

Twenty chemicals released by NYS natural gas compressor stations are associated with eye, brain and central nervous system malignancies, specifically, retinoblastoma and uveal melanoma (C69), brain malignant astrocytoma, carcinoma and glioma (C71), and central nervous system carcinomas (C72).

The top 4 polluters were facilities operated by the Tennessee Gas Pipeline Company. TGPC's Compressor Station 245 in Winfield ranked first with 222,607 pounds or 15.6% of the total, followed by the company's station in LaFayette (187,876 pounds or 12.9%) and its Carlisle facility (160,382 pounds or 11%). These three sites were responsible for 575,865 pounds or 39.4 % of all statewide releases. The top 5 sites were responsible for 862,150 or 59% of the state total. The facility average was 81,202 pounds. (Table 2c.10)

11. Malignant neoplasms: Endocrine glands and related structures (C73-C75)

Ten chemicals released by NYS natural gas compressor stations are associated with endocrine glands and related structure malignancies, specifically, thyroid gland C-cell carcinoma, carcinomas and follicular cell carcinoma (C73) and adrenal gland malignant pheochromocytoma and carcinoma (C74), and pituitary gland carcinoma (C75).

Five of the top 6 polluters were facilities operated by the Tennessee Gas Pipeline Company. TGPC's Compressor Station 245 in Winfield ranked first with 222,166 pounds or 18.2% of the total, followed by NPGSC's Concord station (189,058 pounds or 14.7%) and TGPC's LaFayette facility (179,540 pounds or 12.6%). These three sites were responsible for 590,765 pounds, or 42% of all statewide releases. The top 5 sites were responsible for 877,093 or slightly less than two-thirds (62.2%) of the state total. The facility average was 78,393 pounds. (Table 2c.11)

12. Malignant neoplasms: Secondary and ill-defined (C76-C80)

Six chemicals released by NYS natural gas compressor stations are associated with secondary and ill-defined malignancies, specifically, head carcinoma (C76).

Algonquin Gas Transmission Company's facility in Stony Point, Rockland County, ranked first with 10,793 pounds or slightly less than one-third (32.4%) of the total, followed by the company's facility located in the village of Brewster in the town of Southeast (6,858 pounds or 20.6%). TCPC's station in Eden, Eire County, ranked third (5,172 pounds or 15.5%). These three sites were responsible for 22,823 or slightly more than two-thirds (68.5%) of the total. The top 5 sites were responsible for 28,724 or 86.2% of the state total. The facility average was 1,851 pounds. (Table 2c.12)

13. Malignant Neoplasms, Stated or Presumed to be Primary, of Lymphoid, Haematopoietic and Related Tissue (C81-C96)

Thirty-one chemicals released by NYS natural gas compressor stations are associated with malignant neoplasms stated or presumed to be primary, of lymphoid, haematopoietic and related tissue. These diseases include: Hodgkin's disease (C81), other and unspecified types of non-Hodgkin's lymphoma, including histiocytic sarcomas, lymph sarcomas, lymph system carcinomas and reticulum cell sarcomas (C85), multiple myeloma and malignant plasma cell neoplasms (C90), lymphoid leukemia (C91), myeloid leukemia (C92), leukemia of unspecified cell type, including childhood leukemia (C95), and other and unspecified malignant neoplasms of lymphoid, haematopoietic and related tissue, including blood carcinoma, unspecified leukemia, hematologic and hematopoietic carcinoma (C96).

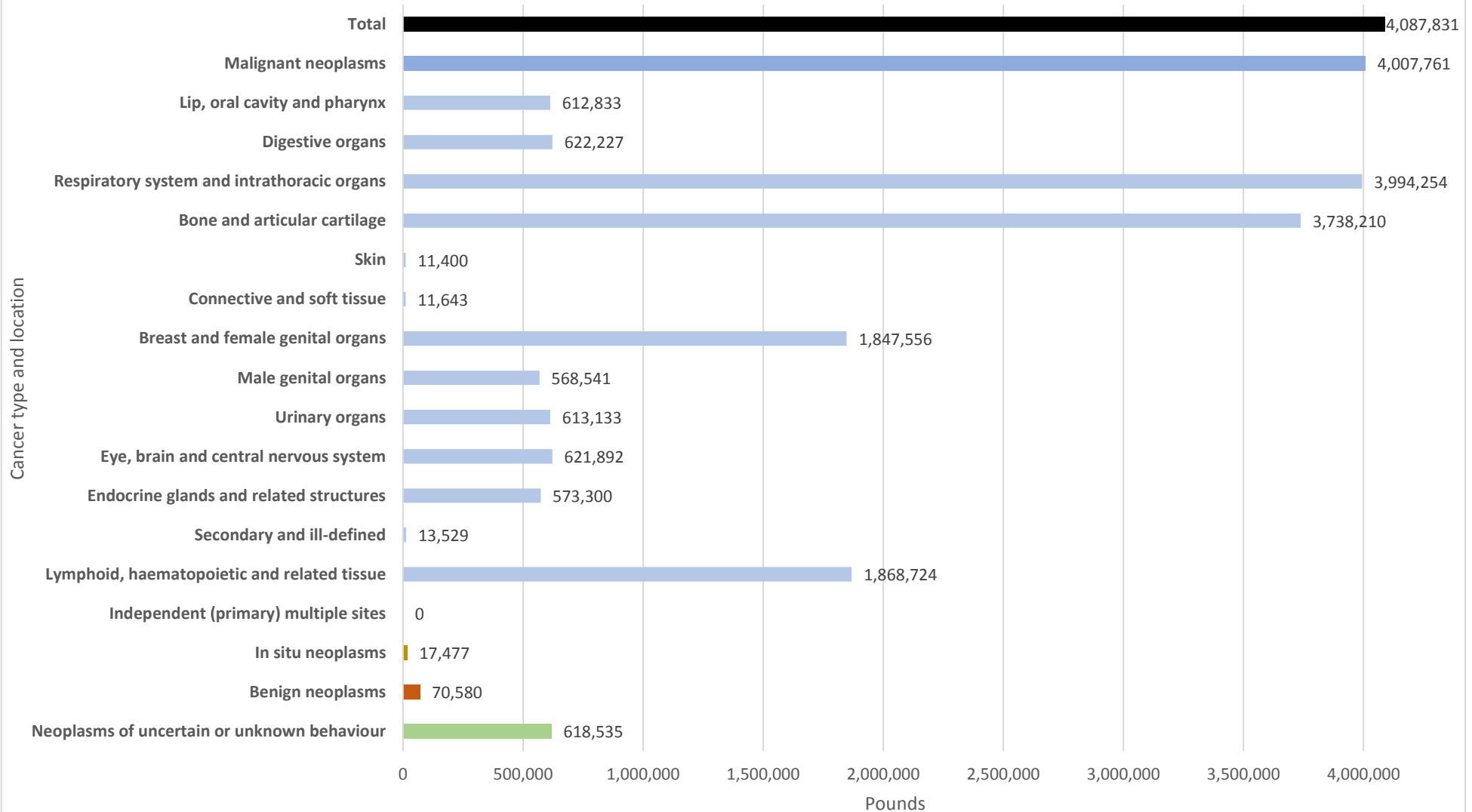
Table 3.b.

Neoplastic Diseases by ICD Category

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| ICD-10 | | | Facilities | | | | Chemicals | | | | Pounds | | | |
|--------|----------------|---|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|----------------|------------------|------------------|------------------|
| # | Code | Description | '08 | '11 | '14 | Tot | '08 | '11 | '14 | Tot | 2008 | 2011 | 2014 | Total |
| 1 | C00-C97 | Malignant neoplasms | 18 | 18 | 17 | 18 | 53 | 54 | 54 | 56 | 744,394 | 1,679,621 | 1,583,745 | 4,007,761 |
| 2 | C00-C14 | Lip, oral cavity and pharynx | 18 | 18 | 16 | 18 | 12 | 14 | 14 | 14 | 118,992 | 254,897 | 238,943 | 612,833 |
| 3 | C15-C26 | Digestive organs | 18 | 18 | 16 | 18 | 37 | 38 | 38 | 38 | 121,690 | 258,670 | 241,866 | 622,227 |
| 4 | C30-C39 | Respiratory system and intrathoracic organs | 18 | 18 | 17 | 18 | 36 | 37 | 37 | 38 | 740,798 | 1,673,574 | 1,579,882 | 3,994,254 |
| 5 | C40-C41 | Bone and articular cartilage | 18 | 18 | 17 | 18 | 33 | 34 | 34 | 35 | 694,106 | 1,551,399 | 1,492,704 | 3,738,210 |
| 6 | C43-C44 | Skin | 16 | 15 | 13 | 16 | 12 | 12 | 12 | 14 | 2,362 | 5,008 | 4,029 | 11,400 |
| 7 | C45-C49 | Connective and soft tissue | 17 | 17 | 15 | 17 | 17 | 17 | 17 | 17 | 1,929 | 5,074 | 4,639 | 11,643 |
| 8 | C50-C58 | Breast and female genital organs | 18 | 18 | 16 | 18 | 23 | 25 | 25 | 25 | 361,015 | 823,303 | 663,237 | 1,847,556 |
| 9 | C60-C63 | Male genital organs | 18 | 17 | 16 | 18 | 12 | 13 | 13 | 13 | 111,217 | 233,176 | 224,147 | 568,541 |
| 10 | C64-C68 | Urinary organs | 18 | 18 | 16 | 18 | 24 | 24 | 24 | 25 | 119,062 | 255,474 | 238,596 | 613,133 |
| 11 | C69-C72 | Eye, brain and central nervous system | 18 | 18 | 16 | 18 | 20 | 20 | 20 | 20 | 121,282 | 258,655 | 241,954 | 621,892 |
| 12 | C73-C75 | Endocrine glands and related structures | 18 | 17 | 16 | 18 | 10 | 10 | 10 | 10 | 112,911 | 235,120 | 225,269 | 573,300 |
| 13 | C76-C80 | Secondary and ill-defined | 17 | 16 | 14 | 17 | 6 | 6 | 6 | 6 | 2,054 | 5,690 | 5,771 | 13,516 |
| 14 | C81-C96 | Malignant neoplasms, stated or presumed to be primary, of lymphoid, haematopoietic and related tissue | 18 | 18 | 16 | 18 | 31 | 31 | 31 | 31 | 364,338 | 833,140 | 671,245 | 1,868,724 |
| 15 | C97 | Malignant neoplasms of independent (primary) multiple sites | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16 | D00-D09 | In situ neoplasms | 16 | 15 | 13 | 16 | 3 | 3 | 3 | 3 | 3,313 | 7,557 | 6,606 | 17,477 |
| 17 | D10-D36 | Benign neoplasms | 17 | 17 | 14 | 17 | 27 | 27 | 27 | 27 | 12,499 | 35,013 | 23,068 | 70,580 |
| 18 | D37-D48 | Neoplasms of uncertain or unknown behavior | 18 | 18 | 16 | 18 | 39 | 40 | 40 | 41 | 121,277 | 257,142 | 240,115 | 618,535 |
| | C00-D48 | Total | 18 | 18 | 17 | 18 | 56 | 57 | 57 | 59 | 751,985 | 1,693,810 | 1,642,034 | 4,087,831 |

C00-D58. Neoplastic Releases by ICD Category: 3 Year Total



3.2c. Releases by Facility: Malignant Neoplasms (ICD-10, C00-C97)

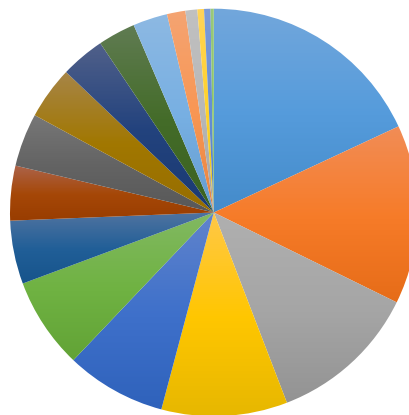
Table 3.2c.

Releases by Facility: Malignant Neoplasms (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Facility | | Location | | Chemicals | | | 7 Years (estimate) | | |
|----------|-----------------------|--------------------|------------|-----------|-----|-----|--------------------|-----------|-------|
| Rank | Facility Name (Short) | Town | County | '08 | '11 | '14 | Average | Tot. Lbs. | % |
| 1 | TGPC CS 245 | Winfield | Herkimer | 37 | 37 | 21 | 727,214 | 1,696,834 | 18.06 |
| 2 | TGPC CS 249 | Carlisle | Schoharie | 37 | 23 | 22 | 572,367 | 1,335,523 | 14.21 |
| 3 | TGPC CS 241 | LaFayette | Onondaga | 36 | 27 | 36 | 478,876 | 1,117,377 | 11.89 |
| 4 | TGPC 229 & TEG DF | Eden | Erie | 39 | 37 | 38 | 402,207 | 938,485 | 9.99 |
| 5 | AGT Stony Point CS | Stony Point | Rockland | 38 | 20 | 19 | 320,291 | 747,345 | 7.95 |
| 6 | TGPC CS 237 | Manchester, Phelps | Ontario | 6 | 5 | 2 | 291,438 | 680,022 | 7.24 |
| 7 | AGT SOUTHEAST CS | Southeast | Putnam | 22 | 15 | 35 | 202,269 | 471,962 | 5.02 |
| 8 | NFGSC Concord CS | Concord | Erie | 8 | 7 | 9 | 174,647 | 407,511 | 4.34 |
| 9 | TGPC CS 254 | Chatham | Columbia | 22 | 13 | 6 | 170,250 | 397,250 | 4.23 |
| 10 | NFGSC Independence CS | Andover | Allegany | 12 | 7 | 14 | 168,124 | 392,290 | 4.17 |
| 11 | DTI Woodhull Station | Woodhull | Steuben | 34 | 43 | 47 | 141,039 | 329,091 | 3.50 |
| 12 | TGPC CS 224 | Clymer | Chautauqua | 37 | 35 | 37 | 119,806 | 279,548 | 2.97 |
| 13 | NFGSC Beech Hill CS | Willing | Allegany | 17 | 17 | 18 | 110,198 | 257,128 | 2.74 |
| 14 | NFGSC Nashville CS | Hanover | Chautauqua | 28 | 26 | - | 39,184 | 137,144 | 1.46 |
| 15 | DTI Utica Station | Frankfort | Herkimer | 28 | 33 | 46 | 37,981 | 88,622 | 0.94 |
| 16 | TGPC CS 230-C | Lockport | Niagara | 22 | 21 | 22 | 21,038 | 49,090 | 0.52 |
| 17 | DTI Borger CS | Ithaca | Tompkins | 34 | 35 | 16 | 20,642 | 48,166 | 0.51 |
| 18 | TGPC CS 233 | York | Livingston | 22 | 13 | 1 | 10,183 | 23,762 | 0.25 |
| | | | | 53 | 54 | 54 | 4,007,754 | 9,397,150 | 100% |

NYS Compressor Station NEI Releases by Facility: 2008-2014
Malignant Neoplasms



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

3.2c.1. Releases by Facility: Malignant Neoplasms, Lip, Oral Cavity & Pharynx (ICD-10, C00-C14)

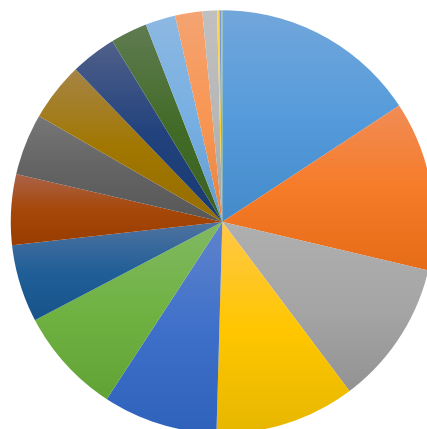
Table 3.3.2c.1.

Releases by Facility: Malignant Neoplasms, Lip, Oral Cavity and Pharynx (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Rank | Facility Name (Short) | Location | | Chemicals | | | 7-Years (Pounds) | | |
|------|-----------------------|--------------------|------------|-----------|-----|-----|------------------|-----------|-------|
| | | Town | County | '08 | '11 | '14 | Average | Total | % |
| 1 | TGPC CS 245 | Winfield | Herkimer | 8 | 8 | 8 | 32,386 | 226,703 | 15.74 |
| 2 | TGPC CS 241 | LaFayette | Onondaga | 8 | 8 | 8 | 26,645 | 186,512 | 12.95 |
| 3 | TGPC CS 249 | Carlisle | Schoharie | 8 | 8 | 8 | 22,754 | 159,281 | 11.06 |
| 4 | TGPC 229 & TEG DF | Eden | Erie | 8 | 8 | 8 | 22,022 | 154,157 | 10.70 |
| 5 | NFGSC Concord CS | Concord | Erie | 2 | 1 | 3 | 18,010 | 126,067 | 8.75 |
| 6 | TGPC CS 237 | Manchester, Phelps | Ontario | 1 | 1 | 1 | 16,708 | 116,956 | 8.12 |
| 7 | AGT Stony Point CS | Stony Point | Rockland | 10 | 7 | 8 | 12,190 | 85,332 | 5.92 |
| 8 | TGPC CS 224 | Clymer | Chautauqua | 8 | 7 | 8 | 11,094 | 77,661 | 5.39 |
| 9 | DTI Woodhull Station | Woodhull | Steuben | 10 | 13 | 13 | 9,688 | 67,813 | 4.71 |
| 10 | NFGSC Independence CS | Andover | Allegany | 6 | 2 | 7 | 9,210 | 64,473 | 4.48 |
| 11 | NFGSC Beech Hill CS | Willing | Allegany | 7 | 7 | 7 | 7,182 | 50,271 | 3.49 |
| 12 | AGT SOUTHEAST CS | Southeast | Putnam | 7 | 6 | 10 | 5,789 | 40,520 | 2.81 |
| 13 | TGPC CS 254 | Chatham | Columbia | 7 | 6 | 1 | 4,723 | 33,063 | 2.30 |
| 14 | NFGSC Nashville CS | Hanover | Chautauqua | 7 | 7 | - | 4,274 | 29,915 | 2.08 |
| 15 | DTI Utica Station | Frankfort | Herkimer | 7 | 11 | 13 | 2,295 | 16,063 | 1.12 |
| 16 | TGPC CS 230-C | Lockport | Niagara | 7 | 7 | 7 | 369 | 2,580 | 0.18 |
| 17 | TGPC CS 233 | York | Livingston | 7 | 6 | 0 | 263 | 1,841 | 0.13 |
| 18 | DTI Borger CS | Ithaca | Tompkins | 10 | 12 | 6 | 189 | 1,322 | 0.09 |
| | | | | 12 | 14 | 14 | 205,790 | 1,440,530 | 100% |

NYS Compressor Station NEI Releases by Facility: 2008-2014 Malignant Neoplasms: Lip, Oral Cavity & Pharynx



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

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3.2c.2. Releases by Facility: Neoplasms, Digestive Organs

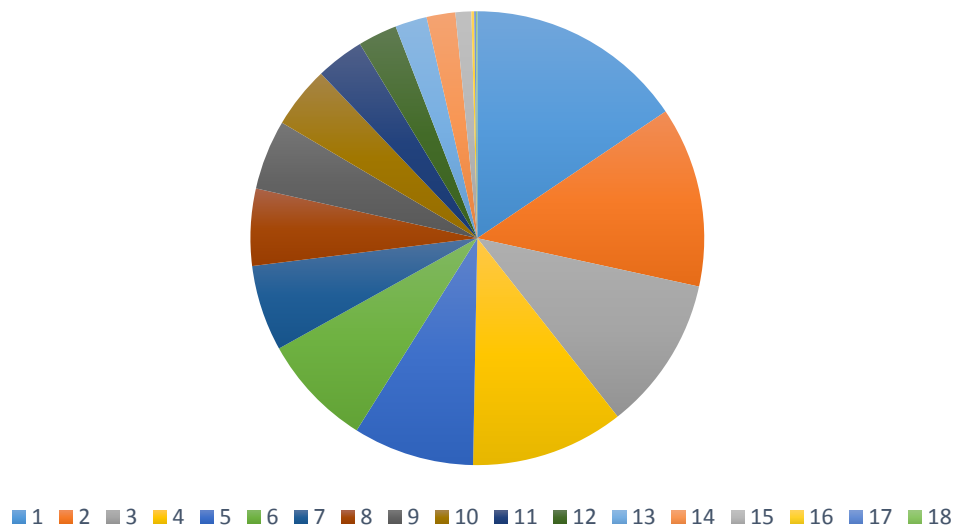
Table 3.2c.2.

Neoplastic Releases by Facility: Digestive Organs (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Rank | Facility Name (Short) | Location | | Chemicals | | | 7-Years (Pounds) | | |
|------|-----------------------|--------------------|------------|-----------|-----|-----|------------------|-----------|-------|
| | | Town | County | '08 | '11 | '14 | Average | Total | % |
| 1 | TGPC CS 245 | Winfield | Herkimer | 29 | 29 | 14 | 32,530 | 227,707 | 15.57 |
| 2 | TGPC CS 241 | LaFayette | Onondaga | 28 | 19 | 28 | 26,850 | 187,951 | 12.85 |
| 3 | TGPC CS 249 | Carlisle | Schoharie | 29 | 16 | 15 | 22,925 | 160,478 | 10.97 |
| 4 | TGPC 229 & TEG DF | Eden | Erie | 28 | 27 | 28 | 22,795 | 159,562 | 10.91 |
| 5 | NFGSC Concord CS | Concord | Erie | 4 | 3 | 5 | 18,010 | 126,068 | 8.62 |
| 6 | TGPC CS 237 | Manchester, Phelps | Ontario | 2 | 1 | 1 | 16,709 | 116,964 | 8.00 |
| 7 | AGT Stony Point CS | Stony Point | Rockland | 29 | 13 | 13 | 12,785 | 89,493 | 6.12 |
| 8 | TGPC CS 224 | Clymer | Chautauqua | 29 | 27 | 29 | 11,454 | 80,175 | 5.48 |
| 9 | DTI Woodhull Station | Woodhull | Steuben | 21 | 28 | 31 | 10,400 | 72,802 | 4.98 |
| 10 | NFGSC Independence CS | Andover | Allegany | 8 | 3 | 10 | 9,211 | 64,478 | 4.41 |
| 11 | NFGSC Beech Hill CS | Willing | Allegany | 12 | 12 | 13 | 7,184 | 50,288 | 3.44 |
| 12 | AGT SOUTHEAST CS | Southeast | Putnam | 14 | 9 | 21 | 5,830 | 40,810 | 2.79 |
| 13 | TGPC CS 254 | Chatham | Columbia | 14 | 7 | 1 | 4,732 | 33,124 | 2.26 |
| 14 | NFGSC Nashville CS | Hanover | Chautauqua | 16 | 16 | - | 4,285 | 29,993 | 2.05 |
| 15 | DTI Utica Station | Frankfort | Herkimer | 16 | 19 | 30 | 2,356 | 16,492 | 1.13 |
| 16 | TGPC CS 230-C | Lockport | Niagara | 14 | 13 | 14 | 399 | 2,792 | 0.19 |
| 17 | TGPC CS 233 | York | Livingston | 14 | 7 | 0 | 278 | 1,945 | 0.13 |
| 18 | DTI Borger CS | Ithaca | Tompkins | 21 | 21 | 11 | 198 | 1,389 | 0.10 |
| | | | | 37 | 37 | 38 | 208,930 | 1,462,509 | 100% |

NYS Compressor Station NEI Releases by Facility: 2008-2014
Malignant Neoplasms: Digestive Organs



3.2c.3. Releases by Facility: Malignant Neoplasms, Respiratory System and Intrathoracic Organs (ICD-10, C30-C9)

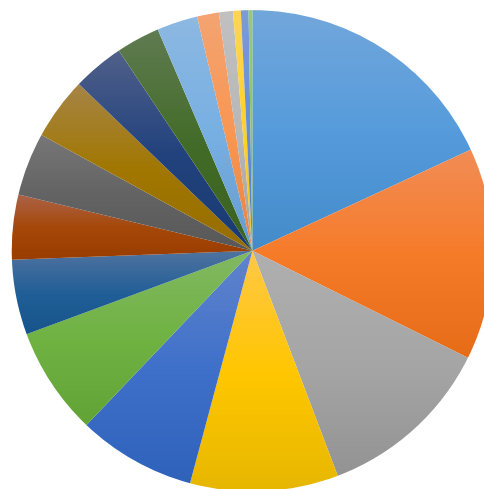
Table 3.2c.3.

Neoplastic Releases by Facility: Respiratory System and Intrathoracic Organs (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Rank | Facility Name (Short) | Location | | Chemicals | | | 7-Years (Pounds) | | |
|------|-----------------------|--------------------|------------|-----------|-----|-----|------------------|-----------|-------|
| | | Town | County | '08 | '11 | '14 | Average | Total | % |
| 1 | TGPC CS 245 | Winfield | Herkimer | 25 | 25 | 17 | 242,124 | 1,694,870 | 18.10 |
| 2 | TGPC CS 249 | Carlisle | Schoharie | 25 | 18 | 17 | 190,447 | 1,333,127 | 14.23 |
| 3 | TGPC CS 241 | LaFayette | Onondaga | 24 | 21 | 24 | 159,204 | 1,114,430 | 11.90 |
| 4 | TGPC 229 & TEG DF | Eden | Erie | 27 | 26 | 27 | 133,041 | 931,287 | 9.94 |
| 5 | AGT Stony Point CS | Stony Point | Rockland | 27 | 17 | 17 | 106,158 | 743,107 | 7.93 |
| 6 | TGPC CS 237 | Manchester, Phelps | Ontario | 5 | 5 | 2 | 97,145 | 680,015 | 7.26 |
| 7 | AGT SOUTHEAST CS | Southeast | Putnam | 20 | 13 | 26 | 67,392 | 471,742 | 5.04 |
| 8 | NFGSC Concord CS | Concord | Erie | 7 | 5 | 7 | 58,212 | 407,483 | 4.35 |
| 9 | TGPC CS 254 | Chatham | Columbia | 20 | 12 | 5 | 56,703 | 396,923 | 4.24 |
| 10 | NFGSC Independence CS | Andover | Allegany | 10 | 6 | 11 | 55,998 | 391,984 | 4.19 |
| 11 | DTI Woodhull Station | Woodhull | Steuben | 27 | 33 | 33 | 46,203 | 323,418 | 3.45 |
| 12 | TGPC CS 224 | Clymer | Chautauqua | 25 | 24 | 25 | 39,258 | 274,805 | 2.93 |
| 13 | NFGSC Beech Hill CS | Willing | Allegany | 15 | 15 | 15 | 36,636 | 256,454 | 2.74 |
| 14 | NFGSC Nashville CS | Hanover | Chautauqua | 21 | 20 | 0 | 19,553 | 136,871 | 1.46 |
| 15 | DTI Utica Station | Frankfort | Herkimer | 21 | 26 | 33 | 12,589 | 88,120 | 0.94 |
| 16 | TGPC CS 230-C | Lockport | Niagara | 20 | 19 | 20 | 7,007 | 49,046 | 0.52 |
| 17 | DTI Borger CS | Ithaca | Tompkins | 27 | 28 | 15 | 6,875 | 48,128 | 0.51 |
| 18 | TGPC CS 233 | York | Livingston | 20 | 12 | 1 | 3,391 | 23,740 | 0.25 |
| | | | | 36 | 37 | 37 | 1,337,936 | 9,365,551 | 100% |

NYS Compressor Station NEI Releases by Facility: 2008-2014 Malignant Neoplasms: Respiratory & Intrathoracic Organs



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

3.2c.4. Releases by Facility: Malignant Neoplasms, Bone and Articular Cartilage

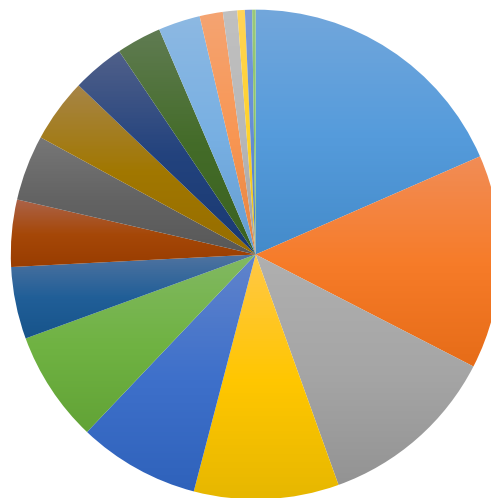
Table 3.2c.4.

Releases by Facility: Malignant Neoplasms, Bone and Articular Cartilage (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Rank | Facility Name (Short) | Location | | Chemicals | | | 7-Years (Pounds) | | |
|------|-----------------------|--------------------|------------|-----------|-----|-----|------------------|-----------|-------|
| | | Town | County | '08 | '11 | '14 | Average | Total | % |
| 1 | TGPC CS 245 | Winfield | Herkimer | 22 | 22 | 14 | 230,920 | 1,616,443 | 18.44 |
| 2 | TGPC CS 249 | Carlisle | Schoharie | 22 | 15 | 14 | 176,886 | 1,238,204 | 14.12 |
| 3 | TGPC CS 241 | LaFayette | Onondaga | 21 | 18 | 21 | 149,626 | 1,047,383 | 11.95 |
| 4 | TGPC 229 & TEG DF | Eden | Erie | 24 | 23 | 24 | 119,758 | 838,307 | 9.56 |
| 5 | AGT Stony Point CS | Stony Point | Rockland | 25 | 14 | 14 | 100,508 | 703,556 | 8.02 |
| 6 | TGPC CS 237 | Manchester, Phelps | Ontario | 4 | 4 | 2 | 91,916 | 643,411 | 7.34 |
| 7 | AGT SOUTHEAST CS | Southeast | Putnam | 18 | 11 | 24 | 59,530 | 416,713 | 4.75 |
| 8 | NFGSC Independence CS | Andover | Allegany | 9 | 5 | 10 | 55,385 | 387,695 | 4.42 |
| 9 | NFGSC Concord CS | Concord | Erie | 6 | 4 | 6 | 54,199 | 379,392 | 4.33 |
| 10 | TGPC CS 254 | Chatham | Columbia | 18 | 10 | 4 | 52,602 | 368,212 | 4.20 |
| 11 | DTI Woodhull Station | Woodhull | Steuben | 25 | 30 | 30 | 43,265 | 302,855 | 3.45 |
| 12 | TGPC CS 224 | Clymer | Chautauqua | 22 | 21 | 22 | 37,179 | 260,256 | 2.97 |
| 13 | NFGSC Beech Hill CS | Willing | Allegany | 13 | 13 | 13 | 34,633 | 242,428 | 2.77 |
| 14 | NFGSC Nashville CS | Hanover | Chautauqua | 20 | 19 | 0 | 19,171 | 134,194 | 1.53 |
| 15 | DTI Utica Station | Frankfort | Herkimer | 20 | 24 | 30 | 11,862 | 83,036 | 0.95 |
| 16 | DTI Borger CS | Ithaca | Tompkins | 25 | 26 | 13 | 6,195 | 43,362 | 0.49 |
| 17 | TGPC CS 230-C | Lockport | Niagara | 18 | 17 | 18 | 5,958 | 41,706 | 0.48 |
| 18 | TGPC CS 233 | York | Livingston | 18 | 10 | 1 | 2,867 | 20,069 | 0.23 |
| | | | | 33 | 33 | 34 | 1,252,460 | 8,767,222 | 100% |

NYS Compressor Station NEI Releases by Facility: 2008-2014
Malignant Neoplasms: Bone and Articular Cartilage



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

3.2c.5. Releases by Facility: Malignant Neoplasms, Skin (ICD-10, C43-C44)

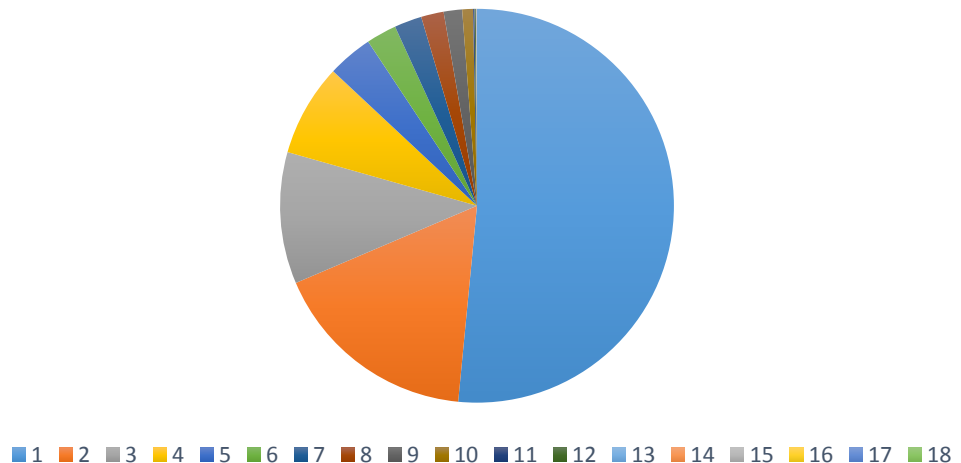
Table 3.2c.5.

Releases by Facility: Malignant Neoplasms, Skin (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Facility | | Location | | Chemicals | | | 3-Yr Avg. | 7 Years (estimate) | |
|----------|-----------------------|--------------------|------------|-----------|-----|-----|-----------|--------------------|-------|
| Rank | Facility Name (Short) | Town | County | '08 | '11 | '14 | Pounds | Pounds | % |
| 1 | TGPC 229 & TEG DF | Eden | Erie | 9 | 8 | 8 | 1,964 | 13,750 | 51.53 |
| 2 | AGT Stony Point CS | Stony Point | Rockland | 6 | 3 | 2 | 650 | 4,553 | 17.06 |
| 3 | DTI Woodhull Station | Woodhull | Steuben | 8 | 9 | 11 | 412 | 2,883 | 10.80 |
| 4 | AGT SOUTHEAST CS | Southeast | Putnam | 3 | 2 | 8 | 289 | 2,022 | 7.58 |
| 5 | TGPC CS 224 | Clymer | Chautauqua | 7 | 7 | 7 | 141 | 990 | 3.71 |
| 6 | DTI Utica Station | Frankfort | Herkimer | 7 | 8 | 11 | 95 | 665 | 2.49 |
| 7 | TGPC CS 241 | LaFayette | Onondaga | 7 | 5 | 7 | 86 | 602 | 2.26 |
| 8 | TGPC CS 249 | Carlisle | Schoharie | 7 | 4 | 4 | 71 | 495 | 1.86 |
| 9 | TGPC CS 245 | Winfield | Herkimer | 7 | 7 | 4 | 58 | 404 | 1.51 |
| 10 | TGPC CS 254 | Chatham | Columbia | 3 | 1 | 0 | 33 | 234 | 0.88 |
| 11 | TGPC CS 230-C | Lockport | Niagara | 3 | 3 | 3 | 5 | 36 | 0.14 |
| 12 | TGPC CS 233 | York | Livingston | 3 | 1 | 0 | 4 | 28 | 0.10 |
| 13 | DTI Borger CS | Ithaca | Tompkins | 8 | 8 | 2 | 2 | 16 | 0.06 |
| 14 | NFGSC Beech Hill CS | Willing | Allegany | 2 | 2 | 2 | 1 | 7 | 0.03 |
| 15 | NFGSC Nashville CS | Hanover | Chautauqua | 7 | 5 | 0 | 0.01 | 0.09 | 0.00 |
| 16 | TGPC CS 237 | Manchester, Phelps | Ontario | 0 | 0 | 0 | 0 | 0.00 | 0.00 |
| 17 | NFGSC Independence CS | Andover | Allegany | 0 | 0 | 0 | 0 | 0.00 | 0.00 |
| 18 | NFGSC Concord CS | Concord | Erie | 0 | 0 | 0 | 0 | 0.00 | 0.00 |
| | | | | 12 | 12 | 12 | 3,812 | 26,686 | 100% |

NYS Compressor Station NEI Releases by Facility: 2008-2014
Malignant Neoplasms: Skin



3.2c.6. Releases by Facility: Malignant Neoplasms, Connective and Soft Tissue

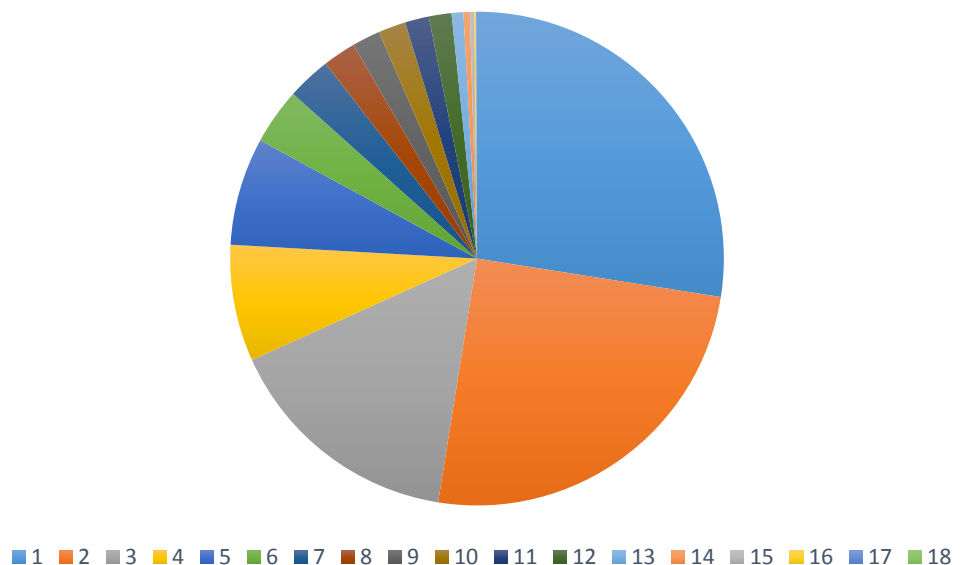
Table 3.2c.6.

Releases by Facility: Malignant Neoplasms, Connective and Soft Tissue (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Facility | | Location | | Chemicals | | | 3-Yr Average | 7 Years (estimate) | |
|----------|-----------------------|--------------------|------------|-----------|-----|-----|--------------|--------------------|-------|
| Rank | Facility Name (Short) | Town | County | '08 | '11 | '14 | Pounds | Pounds | % |
| 1 | AGT Stony Point CS | Stony Point | Rockland | 13 | 3 | 4 | 1,074 | 7,516 | 27.49 |
| 2 | TGPC 229 & TEG DF | Eden | Erie | 9 | 8 | 9 | 978 | 6,843 | 25.03 |
| 3 | AGT SOUTHEAST CS | Southeast | Putnam | 8 | 3 | 11 | 615 | 4,304 | 15.74 |
| 4 | TGPC CS 254 | Chatham | Columbia | 8 | 2 | 1 | 298 | 2,088 | 7.64 |
| 5 | DTI Woodhull Station | Woodhull | Steuben | 12 | 13 | 14 | 276 | 1,930 | 7.06 |
| 6 | TGPC CS 224 | Clymer | Chautauqua | 8 | 8 | 8 | 143 | 1,004 | 3.67 |
| 7 | TGPC CS 230-C | Lockport | Niagara | 8 | 7 | 8 | 112 | 783 | 2.86 |
| 8 | TGPC CS 241 | LaFayette | Onondaga | 7 | 4 | 7 | 85 | 595 | 2.18 |
| 9 | TGPC CS 233 | York | Livingston | 8 | 2 | 0 | 72 | 502 | 1.83 |
| 10 | TGPC CS 249 | Carlisle | Schoharie | 8 | 4 | 4 | 70 | 493 | 1.80 |
| 11 | DTI Utica Station | Frankfort | Herkimer | 10 | 11 | 14 | 61 | 428 | 1.56 |
| 12 | TGPC CS 245 | Winfield | Herkimer | 8 | 8 | 4 | 58 | 406 | 1.48 |
| 13 | DTI Borger CS | Ithaca | Tompkins | 12 | 12 | 4 | 30 | 211 | 0.77 |
| 14 | NFGSC Concord CS | Concord | Erie | 2 | 1 | 2 | 16 | 113 | 0.41 |
| 15 | NFGSC Beech Hill CS | Willing | Allegany | 4 | 4 | 4 | 12 | 81 | 0.30 |
| 16 | NFGSC Independence CS | Andover | Allegany | 3 | 1 | 3 | 4 | 30 | 0.11 |
| 17 | NFGSC Nashville CS | Hanover | Chautauqua | 10 | 10 | 0 | 2 | 15 | 0.06 |
| 18 | TGPC CS 237 | Manchester, Phelps | Ontario | 0 | 0 | 0 | | 0 | 0.00 |
| | | | | 17 | 17 | 17 | 3,906 | 27,341 | 100 % |

NYS Compressor Station NEI Releases by Facility: 2008-2014
Malignant Neoplasms: Connective & Soft Tissue



3.2c.7. Releases by Facility: Malignant Neoplasms, Breast and Female Genital Organs

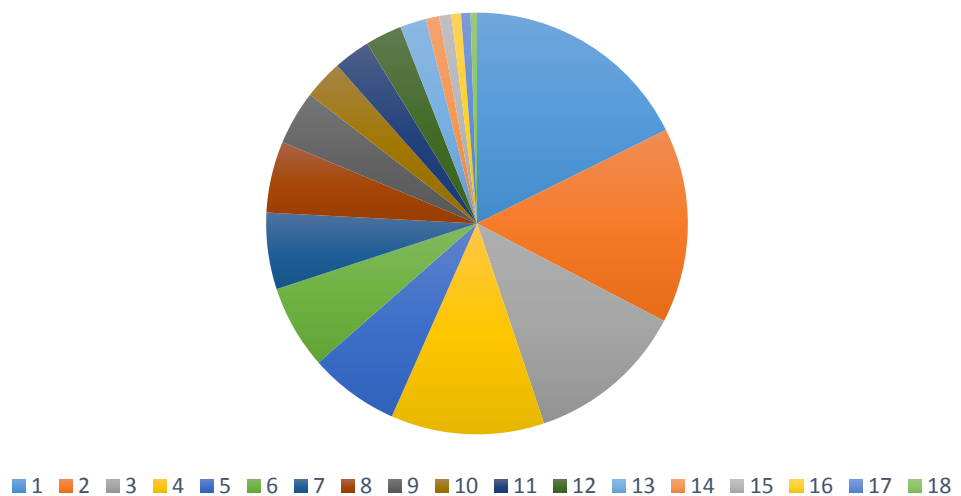
Table 3.2c.7.

Releases by Facility: Malignant Neoplasms, Breast and Female Genital Organs (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Facility | | Location | | Chemicals | | | 3-Yr Average | 7 Years (estimate) | |
|----------|-----------------------|--------------------|------------|-----------|-----|-----|--------------|--------------------|-------|
| Rank | Facility Name (Short) | Town | County | '08 | '11 | '14 | Pounds | Pounds | % |
| 1 | TGPC CS 245 | Winfield | Herkimer | 19 | 19 | 12 | 109,526 | 766,684 | 17.68 |
| 2 | TGPC CS 249 | Carlisle | Schoharie | 19 | 12 | 12 | 92,652 | 648,570 | 14.96 |
| 3 | TGPC 229 & TEG DF | Eden | Erie | 17 | 17 | 17 | 75,644 | 529,510 | 12.21 |
| 4 | TGPC CS 241 | LaFayette | Onondaga | 19 | 13 | 19 | 72,893 | 510,251 | 11.77 |
| 5 | TGPC CS 237 | Manchester, Phelps | Ontario | 5 | 4 | 1 | 42,836 | 299,858 | 6.92 |
| 6 | NFGSC Concord CS | Concord | Erie | 5 | 4 | 5 | 39,852 | 278,969 | 6.43 |
| 7 | AGT SOUTHEAST CS | Southeast | Putnam | 11 | 8 | 14 | 36,301 | 254,113 | 5.86 |
| 8 | AGT Stony Point CS | Stony Point | Rockland | 17 | 9 | 9 | 33,931 | 237,522 | 5.48 |
| 9 | TGPC CS 254 | Chatham | Columbia | 11 | 7 | 5 | 25,753 | 180,276 | 4.16 |
| 10 | DTI Woodhull Station | Woodhull | Steuben | 12 | 18 | 19 | 18,612 | 130,284 | 3.00 |
| 11 | NFGSC Beech Hill CS | Willing | Allegany | 9 | 9 | 9 | 17,439 | 122,076 | 2.82 |
| 12 | TGPC CS 224 | Clymer | Chautauqua | 19 | 17 | 19 | 17,399 | 121,793 | 2.81 |
| 13 | NFGSC Independence CS | Andover | Allegany | 6 | 5 | 6 | 12,417 | 86,924 | 2.00 |
| 14 | NFGSC Nashville CS | Hanover | Chautauqua | 9 | 9 | 0 | 6,339 | 44,373 | 1.02 |
| 15 | TGPC CS 230-C | Lockport | Niagara | 11 | 11 | 11 | 5,817 | 40,721 | 0.94 |
| 16 | DTI Utica Station | Frankfort | Herkimer | 9 | 13 | 19 | 4,536 | 31,755 | 0.73 |
| 17 | TGPC CS 233 | York | Livingston | 11 | 7 | 0 | 4,454 | 31,181 | 0.72 |
| 18 | DTI Borger CS | Ithaca | Tompkins | 12 | 14 | 8 | 3,040 | 21,283 | 0.49 |
| | | | | 23 | 25 | 24 | 619,441 | 4,336,143 | 100 % |

NYS Compressor Station NEI Releases by Facility: 2008-2014
Malignant Neoplasms: Breast & Female Genital Organs



3.2c.8. Releases by Facility: Malignant Neoplasms, Male Genital Organs

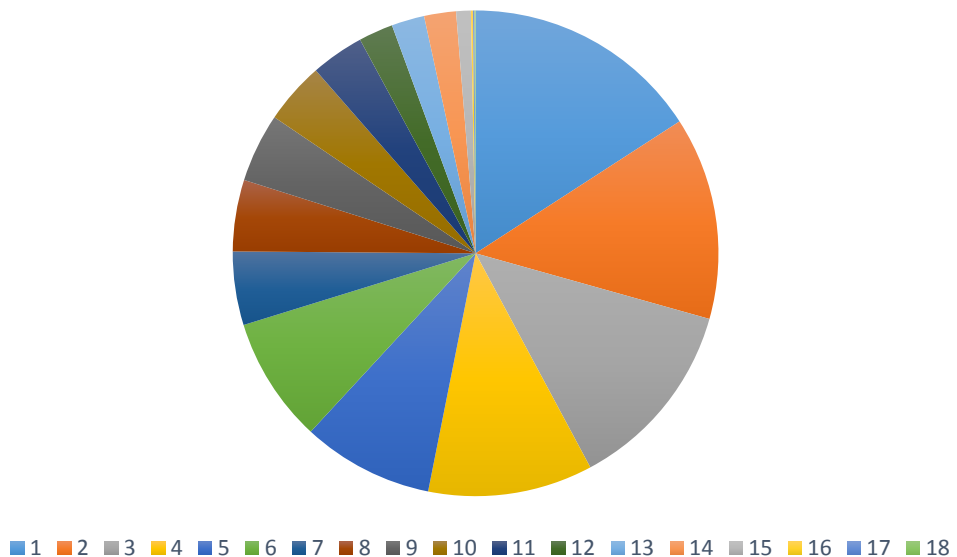
Table 3.2c.8.

Releases by Facility: Malignant Neoplasms, Male Genital Organs (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Facility | | Location | | Chemicals | | | 3-Yr Average | 7 Years (estimate) | |
|----------|-----------------------|--------------------|------------|-----------|-----|-----|--------------|--------------------|-------|
| Rank | Facility Name (Short) | Town | County | '08 | '11 | '14 | Pounds | Pounds | % |
| 1 | TGPC CS 245 | Winfield | Herkimer | 9 | 9 | 7 | 31,720 | 222,045 | 15.86 |
| 2 | NFGSC Concord CS | Concord | Erie | 1 | 0 | 1 | 26,984 | 188,888 | 13.49 |
| 3 | TGPC CS 241 | LaFayette | Onondaga | 9 | 9 | 9 | 25,625 | 179,381 | 12.81 |
| 4 | TGPC CS 249 | Carlisle | Schoharie | 9 | 9 | 8 | 21,934 | 153,543 | 10.97 |
| 5 | TGPC 229 & TEG DF | Eden | Erie | 8 | 8 | 8 | 17,479 | 122,356 | 8.74 |
| 6 | TGPC CS 237 | Manchester, Phelps | Ontario | 1 | 1 | 1 | 16,708 | 116,956 | 8.35 |
| 7 | AGT Stony Point CS | Stony Point | Rockland | 7 | 6 | 5 | 9,786 | 68,506 | 4.89 |
| 8 | TGPC CS 224 | Clymer | Chautauqua | 9 | 8 | 9 | 9,516 | 66,614 | 4.76 |
| 9 | NFGSC Independence CS | Andover | Allegany | 1 | 1 | 3 | 9,162 | 64,140 | 4.58 |
| 10 | DTI Woodhull Station | Woodhull | Steuben | 1 | 10 | 10 | 8,215 | 57,511 | 4.11 |
| 11 | NFGSC Beech Hill CS | Willing | Allegany | 4 | 4 | 4 | 7,072 | 49,504 | 3.54 |
| 12 | AGT SOUTHEAST CS | Southeast | Putnam | 5 | 4 | 6 | 4,587 | 32,109 | 2.29 |
| 13 | TGPC CS 254 | Chatham | Columbia | 5 | 3 | 1 | 4,381 | 30,670 | 2.19 |
| 14 | NFGSC Nashville CS | Hanover | Chautauqua | 4 | 4 | 0 | 4,243 | 29,704 | 2.12 |
| 15 | DTI Utica Station | Frankfort | Herkimer | 4 | 6 | 9 | 1,947 | 13,631 | 0.97 |
| 16 | TGPC CS 230-C | Lockport | Niagara | 5 | 5 | 5 | 273 | 1,915 | 0.14 |
| 17 | TGPC CS 233 | York | Livingston | 5 | 3 | 0 | 194 | 1,363 | 0.10 |
| 18 | DTI Borger CS | Ithaca | Tompkins | 7 | 7 | 4 | 152 | 1,070 | 0.08 |
| | | | | 12 | 13 | 13 | 199,978 | 1,399,906 | 100% |

NYS Compressor Station NEI Releases by Facility: 2008-2014
Malignant Neoplasms: Male Genital Organs



3.2c.9. Releases by Facility: Urinary Organs

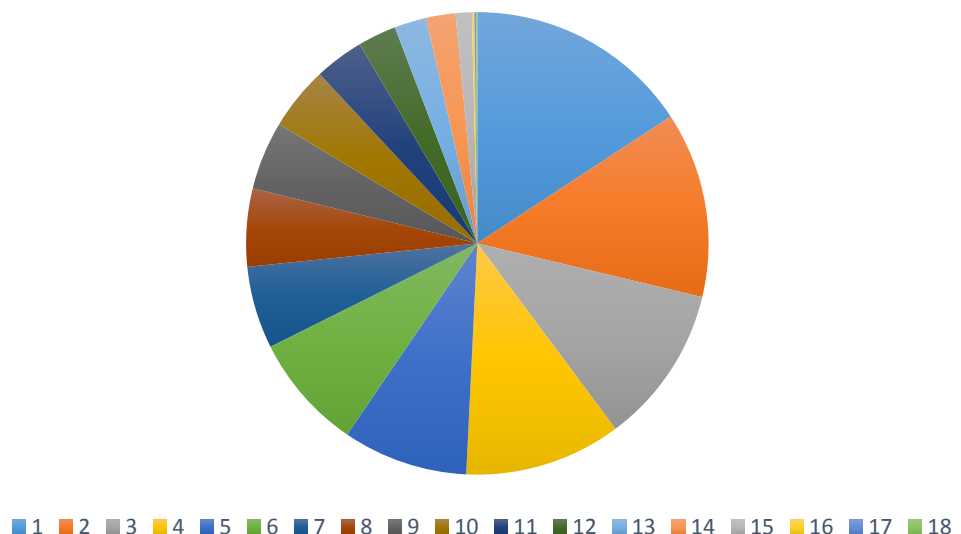
Table 3.2c.9.

Neoplastic Releases by Facility: Urinary Organs (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Facility | | Location | | Chemicals | | | Pounds | 7 Years (estimate) | |
|----------|-----------------------|--------------------|------------|-----------|-----|-----|---------|--------------------|-------|
| Rank | Facility Name (Short) | Town | County | '08 | '11 | '14 | Average | Pounds | % |
| 1 | TGPC CS 245 | Winfield | Herkimer | 17 | 17 | 10 | 32,435 | 227,047 | 15.75 |
| 2 | TGPC CS 241 | LaFayette | Onondaga | 16 | 13 | 16 | 26,713 | 186,990 | 12.98 |
| 3 | TGPC CS 249 | Carlisle | Schoharie | 17 | 12 | 11 | 22,813 | 159,689 | 11.08 |
| 4 | TGPC 229 & TEG DF | Eden | Erie | 17 | 16 | 17 | 22,555 | 157,886 | 10.96 |
| 5 | NFGSC Concord CS | Concord | Erie | 4 | 2 | 4 | 18,006 | 126,040 | 8.75 |
| 6 | TGPC CS 237 | Manchester, Phelps | Ontario | 2 | 1 | 1 | 16,709 | 116,964 | 8.12 |
| 7 | AGT Stony Point CS | Stony Point | Rockland | 17 | 9 | 8 | 11,843 | 82,900 | 5.75 |
| 8 | TGPC CS 224 | Clymer | Chautauqua | 17 | 16 | 17 | 11,221 | 78,549 | 5.45 |
| 9 | DTI Woodhull Station | Woodhull | Steuben | 15 | 19 | 22 | 9,842 | 68,893 | 4.78 |
| 10 | NFGSC Independence CS | Andover | Allegany | 6 | 3 | 7 | 9,168 | 64,174 | 4.45 |
| 11 | NFGSC Beech Hill CS | Willing | Allegany | 8 | 8 | 8 | 7,081 | 49,565 | 3.44 |
| 12 | AGT SOUTHEAST CS | Southeast | Putnam | 12 | 6 | 15 | 5,538 | 38,766 | 2.69 |
| 13 | TGPC CS 254 | Chatham | Columbia | 12 | 5 | 1 | 4,607 | 32,249 | 2.24 |
| 14 | NFGSC Nashville CS | Hanover | Chautauqua | 12 | 11 | 0 | 4,246 | 29,721 | 2.06 |
| 15 | DTI Utica Station | Frankfort | Herkimer | 12 | 13 | 21 | 2,324 | 16,269 | 1.13 |
| 16 | TGPC CS 230-C | Lockport | Niagara | 12 | 11 | 12 | 353 | 2,469 | 0.17 |
| 17 | TGPC CS 233 | York | Livingston | 12 | 5 | 0 | 248 | 1,733 | 0.12 |
| 18 | DTI Borger CS | Ithaca | Tompkins | 15 | 14 | 7 | 175 | 1,227 | 0.09 |
| | | | | 24 | 24 | 24 | 205,876 | 1,441,130 | 100% |

NYS Compressor Station NEI Releases by Facility: 2008-2014
Neoplastic Releases: Urinary Organs



3.2c.10. Releases by Facility: Malignant Neoplasms, Eye, Brain and Central Nervous System (C69-C72)

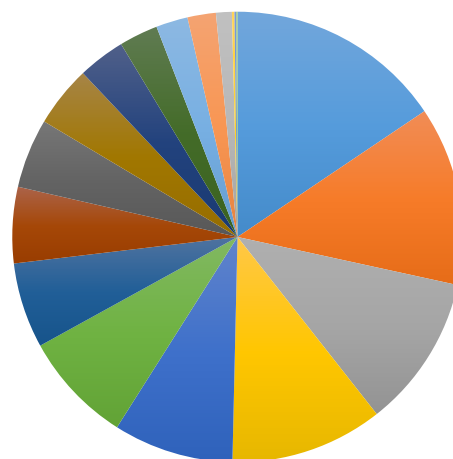
Table 3.2c.10.

Releases by Facility: Malignant Neoplasms, Eye, Brain and Central Nervous System (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Facility | | Location | | Chemicals | | | Pounds | 7 Years (estimate) | |
|----------|-----------------------|--------------------|------------|-----------|-----|-----|---------|--------------------|-------|
| Rank | Facility Name (Short) | Town | County | '08 | '11 | '14 | Average | Pounds | % |
| 1 | TGPC CS 245 | Winfield | Herkimer | 18 | 18 | 14 | 32,515 | 227,607 | 15.57 |
| 2 | TGPC CS 241 | LaFayette | Onondaga | 17 | 15 | 17 | 26,839 | 187,876 | 12.85 |
| 3 | TGPC CS 249 | Carlisle | Schoharie | 18 | 14 | 14 | 22,912 | 160,382 | 10.97 |
| 4 | TGPC 229 & TEG DF | Eden | Erie | 15 | 14 | 15 | 22,892 | 160,246 | 10.96 |
| 5 | NFGSC Concord CS | Concord | Erie | 4 | 2 | 4 | 18,006 | 126,040 | 8.62 |
| 6 | TGPC CS 237 | Manchester, Phelps | Ontario | 2 | 1 | 1 | 16,709 | 116,964 | 8.00 |
| 7 | AGT Stony Point CS | Stony Point | Rockland | 15 | 10 | 11 | 12,801 | 89,604 | 6.13 |
| 8 | TGPC CS 224 | Clymer | Chautauqua | 18 | 16 | 18 | 11,403 | 79,821 | 5.46 |
| 9 | DTI Woodhull Station | Woodhull | Steuben | 12 | 16 | 18 | 10,419 | 72,931 | 4.99 |
| 10 | NFGSC Independence CS | Andover | Allegany | 7 | 3 | 9 | 9,168 | 64,177 | 4.39 |
| 11 | NFGSC Beech Hill CS | Willing | Allegany | 9 | 9 | 10 | 7,086 | 49,600 | 3.39 |
| 12 | AGT SOUTHEAST CS | Southeast | Putnam | 11 | 9 | 13 | 5,828 | 40,796 | 2.79 |
| 13 | TGPC CS 254 | Chatham | Columbia | 11 | 7 | 2 | 4,770 | 33,391 | 2.28 |
| 14 | NFGSC Nashville CS | Hanover | Chautauqua | 8 | 8 | 0 | 4,257 | 29,798 | 2.04 |
| 15 | DTI Utica Station | Frankfort | Herkimer | 8 | 11 | 18 | 2,367 | 16,569 | 1.13 |
| 16 | TGPC CS 230-C | Lockport | Niagara | 11 | 10 | 11 | 375 | 2,626 | 0.18 |
| 17 | TGPC CS 233 | York | Livingston | 11 | 7 | 0 | 268 | 1,874 | 0.13 |
| 18 | DTI Borger CS | Ithaca | Tompkins | 12 | 12 | 9 | 191 | 1,338 | 0.09 |
| | | | | 20 | 20 | 20 | 208,806 | 1,461,640 | 100 |

NYS Compressor Station NEI Releases by Facility: 2008-2014 Malignant Neoplasms: Eye, Brain & CNS



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

3.2c.11. Releases by Facility: Malignant Neoplasms, Endocrine Glands & Related Structures (C73-C75)

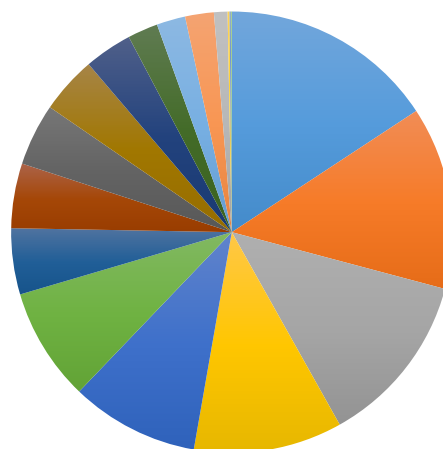
Table 3.2c.11.

Releases by Facility: Malignant Neoplasms, Endocrine Glands and Related Structures (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Facility | | Location | | Chemicals | | | 3-Yr Average | 7 Years (estimate) | |
|----------|-----------------------|--------------------|------------|-----------|-----|-----|--------------|--------------------|-------|
| Rank | Facility Name (Short) | Town | County | '08 | '11 | '14 | Pounds | Pounds | % |
| 1 | TGPC CS 245 | Winfield | Herkimer | 7 | 7 | 3 | 31,738 | 222,166 | 18.18 |
| 2 | NFGSC Concord CS | Concord | Erie | 2 | 0 | 2 | 27,008 | 189,058 | 14.69 |
| 3 | TGPC CS 241 | LaFayette | Onondaga | 7 | 3 | 7 | 25,649 | 179,540 | 12.58 |
| 4 | TGPC CS 249 | Carlisle | Schoharie | 7 | 3 | 3 | 21,956 | 153,691 | 10.85 |
| 5 | TGPC 229 & TEG DF | Eden | Erie | 7 | 7 | 7 | 18,948 | 132,638 | 9.57 |
| 6 | TGPC CS 237 | Manchester, Phelps | Ontario | 1 | 1 | 1 | 16,708 | 116,956 | 5.59 |
| 7 | AGT Stony Point CS | Stony Point | Rockland | 10 | 4 | 4 | 9,756 | 68,294 | 5.48 |
| 8 | TGPC CS 224 | Clymer | Chautauqua | 7 | 7 | 7 | 9,565 | 66,955 | 5.25 |
| 9 | NFGSC Independence CS | Andover | Allegany | 3 | 2 | 3 | 9,167 | 64,169 | 4.83 |
| 10 | DTI Woodhull Station | Woodhull | Steuben | 6 | 10 | 9 | 8,441 | 59,084 | 4.05 |
| 11 | NFGSC Beech Hill CS | Willing | Allegany | 4 | 4 | 4 | 7,068 | 49,477 | 2.57 |
| 12 | AGT SOUTHEAST CS | Southeast | Putnam | 6 | 3 | 5 | 4,481 | 31,369 | 2.43 |
| 13 | NFGSC Nashville CS | Hanover | Chautauqua | 4 | 4 | 0 | 4,246 | 29,719 | 2.43 |
| 14 | TGPC CS 254 | Chatham | Columbia | 6 | 2 | 1 | 4,234 | 29,641 | 1.15 |
| 15 | DTI Utica Station | Frankfort | Herkimer | 4 | 5 | 9 | 2,003 | 14,020 | 0.16 |
| 16 | TGPC CS 230-C | Lockport | Niagara | 6 | 6 | 6 | 282 | 1,972 | 0.11 |
| 17 | TGPC CS 233 | York | Livingston | 6 | 2 | 0 | 189 | 1,320 | 0.08 |
| 18 | DTI Borger CS | Ithaca | Tompkins | 6 | 6 | 4 | 142 | 997 | 0.00 |
| | | | | 10 | 10 | 10 | 201,581 | 1,411,067 | 100% |

NYS Compressor Station NEI Releases by Facility: 2008-2014 Neplastic Releases: Endocrine and Related Structures



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

3.2c.12. Releases by Facility: Malignant Neoplasms, Secondary and Ill-defined (ICD-10, C76-C80)

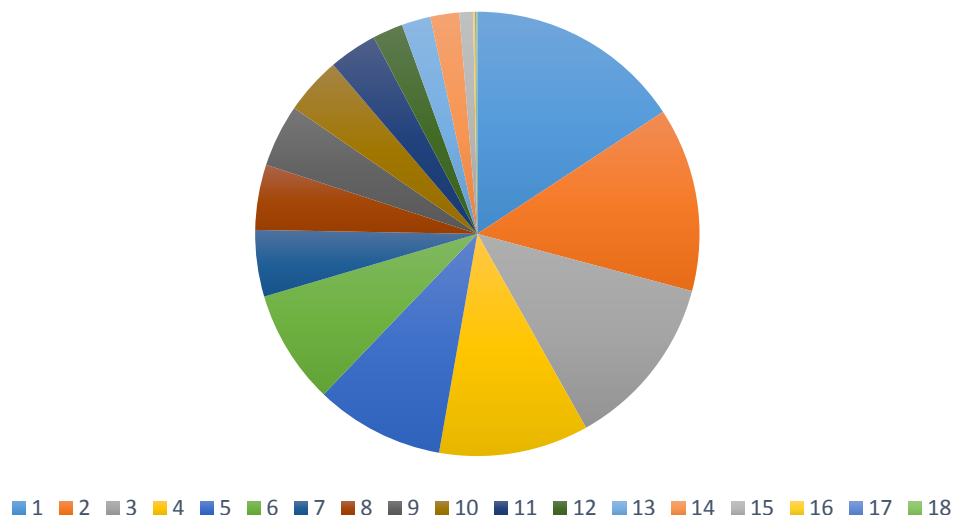
Table 3.2c.12.

Releases by Facility: Malignant Neoplasms, Secondary and Ill-defined (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Facility | | Location | | Chemicals | | | 3-Yr Average | 7 Years (estimate) | |
|----------|-----------------------|--------------------|------------|-----------|-----|-----|--------------|--------------------|-------|
| Rank | Facility Name (Short) | Town | County | '08 | '11 | '14 | Pounds | Pounds | % |
| 1 | AGT Stony Point CS | Stony Point | Rockland | 5 | 3 | 3 | 1,542 | 10,793 | 32.39 |
| 2 | AGT SOUTHEAST CS | Southeast | Putnam | 5 | 3 | 5 | 980 | 6,858 | 20.58 |
| 3 | TGPC 229 & TEG DF | Eden | Erie | 4 | 4 | 4 | 739 | 5,172 | 15.52 |
| 4 | TGPC CS 254 | Chatham | Columbia | 5 | 3 | 0 | 642 | 4,497 | 13.50 |
| 5 | DTI Woodhull Station | Woodhull | Steuben | 5 | 6 | 6 | 201 | 1,405 | 4.22 |
| 6 | TGPC CS 230-C | Lockport | Niagara | 5 | 5 | 5 | 137 | 962 | 2.89 |
| 7 | TGPC CS 224 | Clymer | Chautauqua | 3 | 3 | 3 | 112 | 787 | 2.36 |
| 8 | TGPC CS 233 | York | Livingston | 5 | 3 | 0 | 94 | 659 | 1.98 |
| 9 | TGPC CS 241 | LaFayette | Onondaga | 3 | 3 | 3 | 72 | 507 | 1.52 |
| 10 | TGPC CS 249 | Carlisle | Schoharie | 3 | 3 | 3 | 58 | 409 | 1.23 |
| 11 | TGPC CS 245 | Winfield | Herkimer | 3 | 3 | 3 | 47 | 331 | 0.99 |
| 12 | DTI Utica Station | Frankfort | Herkimer | 3 | 5 | 6 | 44 | 306 | 0.92 |
| 13 | DTI Borger CS | Ithaca | Tompkins | 5 | 6 | 3 | 43 | 300 | 0.90 |
| 14 | NFGSC Concord CS | Concord | Erie | 1 | 0 | 1 | 24 | 170 | 0.51 |
| 15 | NFGSC Beech Hill CS | Willing | Allegany | 3 | 3 | 3 | 17 | 116 | 0.35 |
| 16 | NFGSC Independence CS | Andover | Allegany | 3 | 1 | 4 | 5 | 32 | 0.10 |
| 17 | NFGSC Nashville CS | Hanover | Chautauqua | 3 | 3 | 0 | 2 | 15 | 0.05 |
| 18 | TGPC CS 237 | Manchester, Phelps | Ontario | 0 | 0 | 0 | | 0 | 0.00 |
| | | | | 6 | 6 | 6 | 4,760 | 33,319 | 100% |

NYS Compressor Station Emissions by Facility: 2008-2014
Malignant Neoplasms, Secondary and Ill-defined



DRAFT

3.2c.13. Releases by Facility: Malignant Neoplasms, Stated or Presumed to be Primary, of Lymphoid, Hematopoietic and Related Tissue (ICD-10, C81-96)

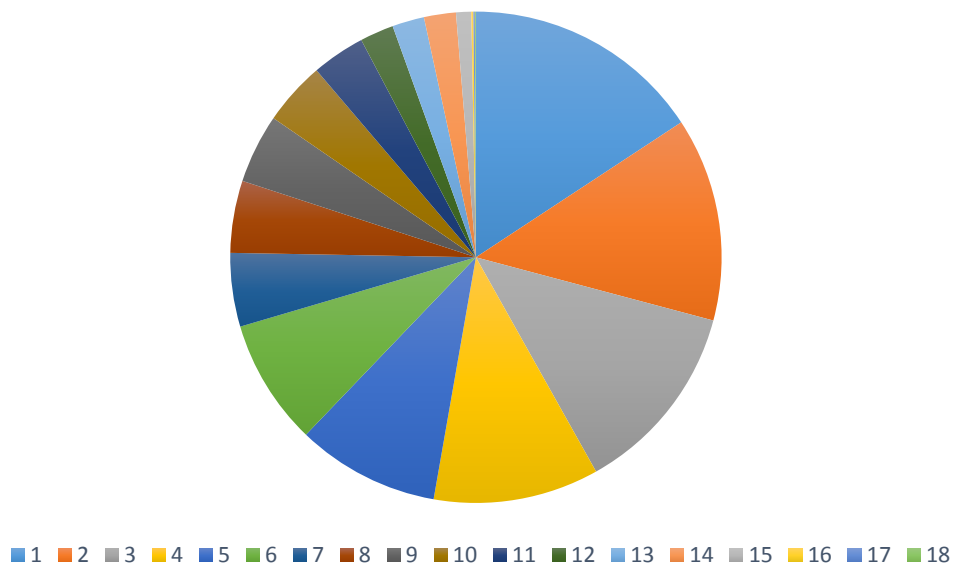
Table 3.2c.13.

Releases by Facility: Malignant Neoplasms, Malignant Neoplasms, Stated or Presumed to be Primary, of Lymphoid, Hematopoietic and Related Tissue (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Facility | | Location | | Chemicals | | | 3-Yr Average | 7 Years (estimate) | |
|----------|-----------------------|--------------------|------------|-----------|-----|-----|--------------|--------------------|-------|
| Rank | Facility Name (Short) | Town | County | '08 | '11 | '14 | Pounds | Pounds | % |
| 1 | TGPC CS 245 | Winfield | Herkimer | 23 | 23 | 15 | 109,764 | 768,346 | 17.52 |
| 2 | TGPC CS 249 | Carlisle | Schoharie | 23 | 16 | 16 | 92,946 | 650,622 | 14.83 |
| 3 | TGPC 229 & TEG DF | Eden | Erie | 25 | 24 | 25 | 77,334 | 541,341 | 12.34 |
| 4 | TGPC CS 241 | LaFayette | Onondaga | 22 | 16 | 22 | 73,255 | 512,783 | 11.69 |
| 5 | TGPC CS 237 | Manchester, Phelps | Ontario | 4 | 4 | 1 | 42,836 | 299,851 | 6.84 |
| 6 | NFGSC Concord CS | Concord | Erie | 5 | 5 | 6 | 39,857 | 278,996 | 6.36 |
| 7 | AGT SOUTHEAST CS | Southeast | Putnam | 16 | 11 | 19 | 37,129 | 259,905 | 5.93 |
| 8 | AGT Stony Point CS | Stony Point | Rockland | 26 | 16 | 15 | 35,662 | 249,635 | 5.69 |
| 9 | TGPC CS 254 | Chatham | Columbia | 16 | 10 | 5 | 26,113 | 182,788 | 4.17 |
| 10 | DTI Woodhull Station | Woodhull | Steuben | 19 | 24 | 27 | 19,186 | 134,302 | 3.06 |
| 11 | TGPC CS 224 | Clymer | Chautauqua | 23 | 22 | 23 | 17,967 | 125,770 | 2.87 |
| 12 | NFGSC Beech Hill CS | Willing | Allegany | 13 | 13 | 13 | 17,550 | 122,849 | 2.80 |
| 13 | NFGSC Independence CS | Andover | Allegany | 9 | 4 | 9 | 12,461 | 87,225 | 1.99 |
| 14 | NFGSC Nashville CS | Hanover | Chautauqua | 15 | 15 | 0 | 6,367 | 44,568 | 1.02 |
| 15 | TGPC CS 230-C | Lockport | Niagara | 16 | 15 | 16 | 5,882 | 41,174 | 0.94 |
| 16 | DTI Utica Station | Frankfort | Herkimer | 15 | 18 | 27 | 4,637 | 32,462 | 0.74 |
| 17 | TGPC CS 233 | York | Livingston | 16 | 10 | 0 | 4,510 | 31,567 | 0.72 |
| 18 | DTI Borger CS | Ithaca | Tompkins | 19 | 19 | 12 | 3,079 | 21,553 | 0.49 |
| | | | | 31 | 31 | 31 | 626,534 | 4,385,736 | 100% |

NYS Compressor Station Emissions by Facility: 2008-2014
Malignant Neoplasms, Lymphoid, Hematopoietic, Related Tissue



3.2d. Releases by DEC Region

The 18 compressor stations analyzed are in 6 of New York's 9 DEC regions. All 6 regions had releases of carcinogens.

DEC Region 9, Western New York, ranked first with 2.5 million pounds or 26% of the state total, followed by Region 6, Western Adirondacks/Eastern Lake Ontario (1,810,984 pounds or 19%) and Region 4, Capital Region/Northern Catskills (1,765,328 pounds or 18.5%). These three regions are responsible for slightly more than one-half (53%) of all toxic releases.

Table 3.2d.

C00-D58. Neoplastic Releases by DEC Region (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| | | County | | 3 Years: 2008, 2011, 2014 | | | 7-Year Estimate: 2008-2014 | | |
|------|--------------------------------------|------------|------|---------------------------|------|--------------|----------------------------|--------------|-------|
| Rank | NYS DEC Region | Name | Rank | Fac's | Ch's | Total Pounds | Average Pounds | Total Pounds | % |
| 1 | 9: Western New York | Allegany | 7 | 2 | 20 | 279,592 | 93,197 | 652,381 | 6.84 |
| | | Chautauqua | 10 | 2 | 54 | 159,795 | 53,265 | 372,856 | 3.91 |
| | | Erie | 2 | 2 | 45 | 583,207 | 194,402 | 1,360,816 | 14.27 |
| | | Niagara | 12 | 1 | 23 | 29,917 | 9,972 | 69,806 | 0.73% |
| | | | | 7 | | 1,052,511 | 350,837 | 2,455,859 | 25.75 |
| 2 | 6: W. Adirondacks/E. Lake Ontario | Herkimer | 1 | 2 | 57 | 776,136 | 258,712 | 1,810,984 | 18.99 |
| 3 | 4: Capital Region/Northern Catskills | Columbia | 9 | 1 | 23 | 173,569 | 57,856 | 404,994 | 4.25 |
| | | Schoharie | 3 | 1 | 41 | 583,000 | 194,333 | 1,360,334 | 14.26 |
| | | | | 2 | | 756,569 | 252,190 | 1,765,328 | 18.51 |
| 4 | 7: Central New York | Onondaga | 8 | 1 | 40 | 216,219 | 72,073 | 504,510 | 5.29 |
| | | Tompkins | 5 | 1 | 42 | 331,393 | 110,464 | 773,250 | 8.11 |
| | | | | 2 | | 547,611 | 182,537 | 1,277,760 | 13.40 |
| 5 | 3: Lower Hudson Valley | Putnam | 8 | 1 | 40 | 216,219 | 72,073 | 504,510 | 5.29 |
| | | Rockland | 5 | 1 | 42 | 331,393 | 110,464 | 773,250 | 8.11 |
| | | | | 2 | | 547,611 | 182,537 | 1,277,760 | 13.40 |
| 6 | 8: Western Finger Lakes | Livingston | 14 | 1 | 23 | 10,477 | 3,492 | 24,447 | 0.26 |
| | | Ontario | 6 | 1 | 7 | 291,994 | 97,331 | 681,320 | 7.14 |
| | | Steuben | 11 | 1 | 53 | 141,258 | 47,086 | 329,603 | 3.46 |
| | | | | 3 | | 443,730 | 147,910 | 1,035,369 | 10.85 |
| | | | | 18 | 59 | 4,087,832 | 1,362,611 | 9,538,274 | 100% |

3.2e. Releases by County

Herkimer County ranked first with 1.8 million pounds or 19% of the state total, followed by Erie County (1,360,816 pounds or 14.27%) and Schoharie with a slightly smaller total (1,360,333 pounds or 14.26%). These three counties are responsible for nearly one-half (47.5%) of all carcinogenic releases.

The top five counties were responsible for slightly more than two-thirds (67.6%) of the state total.

The 14-county average was 681,304 pounds.

Table 3.2e.

C00-D58. Neoplastic Releases by County (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Rank | County | NYS DEC Region | 3 Years: 2008, 2011, 2014 | | | 7-Year Estimate: 2008-2014 | | |
|------|------------|--|---------------------------|-----------|------------------|----------------------------|------------------|------------|
| | | | Fac's | Ch's | Total Pounds | Average Pounds | Total Pounds | % |
| 1 | Herkimer | 6: Western Adirondacks/E. Lake Ontario | 2 | 57 | 776,135 | 258,711 | 1,810,983 | 18.99 |
| 2 | Erie | 9: Western New York | 2 | 45 | 583,207 | 194,402 | 1,360,816 | 14.27 |
| 3 | Schoharie | 4: Capital Region/Northern Catskills | 1 | 41 | 583,000 | 194,333 | 1,360,333 | 14.26 |
| 4 | Onondaga | 7: Central New York | 1 | 40 | 488,561 | 162,853 | 1,139,975 | 11.95 |
| 5 | Rockland | 3: Lower Hudson Valley | 1 | 42 | 331,392 | 110,464 | 773,249 | 8.11 |
| 6 | Ontario | 8: Western Finger Lakes | 1 | 7 | 291,994 | 97,331 | 681,319 | 7.14 |
| 7 | Allegany | 9: Western New York | 2 | 20 | 279,591 | 93,197 | 652,381 | 6.84 |
| 8 | Putnam | 3: Lower Hudson Valley | 1 | 40 | 216,218 | 72,072 | 504,510 | 5.29 |
| 9 | Columbia | 4: Capital Region/Northern Catskills | 1 | 23 | 173,569 | 57,856 | 404,994 | 4.25 |
| 10 | Chautauqua | 9: Western New York | 2 | 54 | 159,795 | 53,265 | 372,855 | 3.91 |
| 11 | Steuben | 8: Western Finger Lakes | 1 | 53 | 141,258 | 47,086 | 329,602 | 3.46 |
| 12 | Niagara | 9: Western New York | 1 | 23 | 29,916 | 9,972 | 69,805 | 0.73 |
| 13 | Tompkins | 7: Central New York | 1 | 40 | 22,713 | 7,571 | 52,997 | 0.56 |
| 14 | Livingston | 8: Western Finger Lakes | 1 | 23 | 10,477 | 3,492 | 24,446 | 0.26 |
| | | | 18 | 59 | 4,087,826 | 1,362,605 | 9,538,265 | 100 |

3.3. Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism (D50-D89)

3.3a. Releases by Chemical

Forty-one of the 70 chemicals released by NYS natural gas compressor stations are associated with diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism (ICD 10, Chapter 3). All 18 stations reported such releases. These totaled an estimated 18.7 million pounds from 2008 to 2014--an annual average of 2.7 million pounds.

Chemicals associated with blood and immune system diseases represented 47% of all reported natural gas compressor station releases.

Carbon monoxide was responsible for almost two-thirds (65.9%) of all statewide chemical releases. Volatile organic compounds as a group rank second with 4.9 million pounds (26.2%), followed by formaldehyde with 1.3 million pounds (7%). These three chemicals accounted for 99.1% of the state total.

Table 3.3a.

Diseases of the Blood and Blood-forming Organs and Certain Disorders Involving the Immune Mechanism by Chemical (Top 10 Chemicals by Pounds Released)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Chemical | | Location | | | 3 Years | 7 Year Estimate: 2008 to 2014 | | |
|----------|----------------------------|----------|------|-------|-----------|-------------------------------|------------|-------|
| Rank | Name | Fac's | Cn's | Reg's | Pounds | Average | Pounds | % |
| 1 | Carbon Monoxide | 18 | 14 | 6 | 5,297,028 | 1,765,676 | 12,359,731 | 65.91 |
| 2 | Volatile Organic Compounds | 18 | 14 | 6 | 2,108,741 | 702,914 | 4,920,395 | 26.24 |
| 3 | Formaldehyde | 18 | 14 | 6 | 561,144 | 187,048 | 1,309,335 | 6.98 |
| 4 | Acetaldehyde | 14 | 13 | 6 | 28,272 | 9,424 | 65,969 | 0.35 |
| 5 | Benzene | 16 | 13 | 6 | 9,103 | 3,034 | 21,240 | 0.11 |
| 6 | Methanol | 8 | 7 | 6 | 8,286 | 2,762 | 19,333 | 0.10 |
| 7 | Toluene | 16 | 13 | 6 | 8,275 | 2,758 | 19,307 | 0.10 |
| 8 | Hexane | 13 | 10 | 6 | 5,222 | 1,741 | 12,183 | 0.06 |
| 9 | Xylenes (Mixed Isomers) | 15 | 13 | 6 | 3,598 | 1,199 | 8,394 | 0.04 |
| 10 | 1,3-Butadiene | 14 | 13 | 6 | 2,022 | 674 | 4,718 | 0.03 |
| | | 18 | 14 | 6 | 8,031,690 | 2,677,230 | 18,740,605 | 99.94 |

3.3b. Releases by ICD Category

Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism into 5 major groups. Chemicals released by natural gas compressor stations are positively associated with two of them. It should be remembered, that a single chemical can be associated with more than one category of disease.

D70-D77: Twenty-seven chemicals are associated with Coagulation defects, purpura and other hemorrhagic conditions These chemicals were released by all 18 stations.

D80-D89: Eighteen chemicals had effects broadly characterized as Other diseases of blood and blood-forming organs

Table 3.3b.

Diseases of the Blood and Blood-forming Organs and Certain Disorders Involving the Immune Mechanism by ICD Category

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| ICD-10 | | | Facilities | | | | Chemicals | | | | Pounds | | | |
|--------|-------------|---|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------------|------------------|------------------|------------------|
| # | Description | | '08 | '11 | '14 | Tot | '08 | '11 | '14 | Tot | 2008 | 2011 | 2014 | Total |
| 1 | D50-D53 | Nutritional anemias | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 | D55-D64 | Hemolytic anemias | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 | D65-D69 | Aplastic and other anemias | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | D70-D77 | Coagulation defects, purpura and other hemorrhagic conditions | 18 | 18 | 16 | 18 | 27 | 27 | 27 | 27 | 122,594 | 261,322 | 242,629 | 626,546 |
| 5 | D80-D89 | Other diseases of blood and blood-forming organs | 18 | 18 | 17 | 18 | 17 | 18 | 18 | 18 | 1,534,607 | 2,284,799 | 2,088,789 | 5,908,195 |
| | D50-D89 | Total | 18 | 18 | 17 | 18 | 40 | 41 | 41 | 41 | 1,913,307 | 3,125,530 | 2,997,450 | 8,036,288 |

3.3c. Releases by Facility

The top 6 polluters were facilities operated by the Tennessee Gas Pipeline Company.

TGPC's Compressor Station 245 in Winfield ranked first with 4.1 million pounds or slightly more than one-fifth of the total, followed by the Compressor 249 in Carlisle (2.1 million pounds or 11.1%) and by its LaFayette facility (2 million pounds or 10.3). These three sites were responsible for 8.1 million pounds or 43% of all statewide releases of chemicals associated with blood and immune system disorders.

The top 5 sites were responsible for 11 million pounds (58.5%) of the state total.

The facility average was 1,048,773 pounds.

Table 3.3c.

Diseases of the Blood and Blood-forming Organs and Certain Disorders Involving the Immune Mechanism by Facility

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Facility | | Location | | Chemicals | | | 7 Years (estimate) | | |
|----------|-----------------------|--------------------|------------|-----------|-----|-----|--------------------|------------|-------|
| Rank | Facility Name (Short) | Town | County | '08 | '11 | '14 | Average | Tot. Lbs. | % |
| 1 | TGPC CS 245 | Winfield | Herkimer | 31 | 31 | 17 | 580,733 | 4,065,132 | 21.53 |
| 2 | TGPC CS 249 | Carlisle | Schoharie | 31 | 18 | 18 | 299,205 | 2,094,438 | 11.09 |
| 3 | TGPC CS 241 | LaFayette | Onondaga | 30 | 21 | 30 | 278,630 | 1,950,408 | 10.33 |
| 4 | TGPC 229 & TEG DF | Eden | Erie | 29 | 28 | 29 | 223,059 | 1,561,413 | 8.27 |
| 5 | TGPC CS 237 | Manchester, Phelps | Ontario | 4 | 3 | 3 | 195,395 | 1,367,764 | 7.25 |
| 6 | TGPC CS 254 | Chatham | Columbia | 17 | 10 | 4 | 161,398 | 1,129,784 | 5.98 |
| 7 | AGT Stony Point CS | Stony Point | Rockland | 33 | 15 | 16 | 154,988 | 1,084,914 | 5.75 |
| 8 | NFGSC Independence CS | Andover | Allegany | 10 | 5 | 12 | 147,748 | 1,034,239 | 5.48 |
| 9 | NFGSC Beech Hill CS | Willing | Allegany | 14 | 14 | 15 | 140,703 | 984,922 | 5.22 |
| 10 | NFGSC Concord CS | Concord | Erie | 6 | 5 | 7 | 133,625 | 935,372 | 4.95 |
| 11 | TGPC CS 224 | Clymer | Chautauqua | 31 | 29 | 31 | 105,096 | 735,670 | 3.90 |
| 12 | DTI Woodhull Station | Woodhull | Steuben | 24 | 33 | 36 | 86,690 | 606,832 | 3.21 |
| 13 | AGT SOUTHEAST CS | Southeast | Putnam | 17 | 12 | 24 | 62,269 | 435,886 | 2.31 |
| 14 | NFGSC Nashville CS | Hanover | Chautauqua | 19 | 19 | - | 54,249 | 379,740 | 2.01 |
| 15 | TGPC CS 230-C | Lockport | Niagara | 17 | 16 | 17 | 22,498 | 157,488 | 0.83 |
| 16 | DTI Utica Station | Frankfort | Herkimer | 19 | 23 | 36 | 22,270 | 155,891 | 0.83 |
| 17 | DTI Borger CS | Ithaca | Tompkins | 24 | 25 | 13 | 21,652 | 151,564 | 0.80 |
| 18 | TGPC CS 233 | York | Livingston | 17 | 10 | 2 | 6,638 | 46,465 | 0.25 |
| | | | | 40 | 41 | 41 | 2,696,846 | 18,877,920 | 100% |

3.3d Releases by DEC Region

Six of New York State's nine DEC regions reported releases of toxic chemicals associated with blood and immune system disorders.

DEC Region 9, Western New York, ranked first with an estimated 5.7 million pounds (30.2%) of releases from 2008 to 2014. Region 6, Western Adirondacks/Eastern Lake Ontario, second with 4.2 million pounds (22.5%), followed by Region 4, Capital Region/Northern Catskills with 3.2 million pounds (17.2%).

Table 3.3d.

D50-D89: Diseases of the Blood and Blood-forming Organs and Certain Disorders Involving the Immune Mechanism by DEC Region (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| | | County | | 3 Years: 2008, 2011, 2014 | | | 7-Year Estimate: 2008-2014 | | |
|------|--------------------------------|------------|------|---------------------------|------|--------------|----------------------------|--------------|-------|
| Rank | NYS DEC Region | Name | Rank | Fac's | Ch's | Total Pounds | Average Pounds | Total Pounds | % |
| 1 | 9: Western New York | Allegany | 4 | 2 | 16 | 865,355 | 288,452 | 2,019,161 | 10.77 |
| | | Chautauqua | 9 | 2 | 39 | 423,784 | 141,261 | 988,830 | 5.27 |
| | | Erie | 2 | 2 | 32 | 1,070,051 | 356,684 | 2,496,785 | 13.32 |
| | | Niagara | 12 | 1 | 17 | 67,495 | 22,498 | 157,488 | 0.84 |
| | | | | 7 | 40 | 2,426,684 | 808,895 | 5,662,264 | 30.20 |
| 2 | 6: Adirondacks/E Lake Ontario | Herkimer | 1 | 2 | 40 | 1,809,010 | 603,003 | 4,221,023 | 22.51 |
| 3 | 4: Capital Region/N. Catskills | Columbia | 7 | 1 | 17 | 484,193 | 161,398 | 1,129,784 | 6.03 |
| | | Schoharie | 3 | 1 | 31 | 897,616 | 299,205 | 2,094,438 | 11.17 |
| | | | | 2 | 35 | 1,381,809 | 460,603 | 3,224,222 | 17.19 |
| 4 | 7: Central New York | Onondaga | 5 | 1 | 30 | 835,889 | 278,630 | 1,950,408 | 10.40 |
| | | Tompkins | 13 | 1 | 25 | 64,956 | 21,652 | 151,564 | 0.81 |
| | | | | 2 | 41 | 900,845 | 300,282 | 2,101,972 | 11.21 |
| 5 | 8: Western Finger Lakes | Livingston | 14 | 1 | 17 | 19,913 | 6,638 | 46,465 | 0.25 |
| | | Ontario | 6 | 1 | 4 | 586,185 | 195,395 | 1,367,764 | 7.29 |
| | | Steuben | 10 | 1 | 37 | 260,071 | 86,690 | 606,832 | 3.24 |
| | | | | 3 | 37 | 866,169 | 288,723 | 2,021,060 | 10.78 |
| 6 | 3: Lower Hudson Valley | Livingston | 11 | 1 | 26 | 186,808 | 62,269 | 435,886 | 2.32 |
| | | Ontario | 8 | 1 | 33 | 464,963 | 154,988 | 1,084,914 | 5.79 |
| | | | | 2 | 39 | 651,772 | 217,257 | 1,520,800 | 8.11 |
| | | | | 18 | 41 | 8,036,289 | 2,678,763 | 18,751,340 | 100 |

3.3e. Releases by County

Herkimer County ranked first with 4.2 million pounds or 22.5% of the state total, followed by Erie County (2.5 million pounds or 13.3%) and Schoharie County (2.1 million pounds or 11.2%). These three counties are responsible for nearly one-half (48%) of all releases associated with blood and immune system diseases.

The top five counties were responsible for 12.8 million pounds or slightly more than two-thirds (68.2%) of the state total.

The 14-county average was 1,339,381 pounds.

Table 3.3e.

Diseases of the Blood and Blood-forming Organs and Certain Disorders Involving the Immune Mechanism by County (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Rank | County | NYS DEC Region | 3 Years: 2008, 2011, 2014 | | | 7-Year Estimate: 2008-2014 | | |
|------|------------|--|---------------------------|-----------|------------------|----------------------------|-------------------|-------------|
| | | | Fac's | Ch's | Total Pounds | Average Pounds | Total Pounds | % |
| 1 | Herkimer | 6: Western Adirondacks/E. Lake Ontario | 2 | 40 | 1,809,009 | 603,003 | 4,221,023 | 22.51 |
| 2 | Erie | 9: Western New York | 2 | 32 | 1,070,050 | 356,684 | 2,496,785 | 13.32 |
| 3 | Schoharie | 4: Capital Region/Northern Catskills | 1 | 31 | 897,616 | 299,205 | 2,094,438 | 11.17 |
| 4 | Allegany | 9: Western New York | 2 | 16 | 865,354 | 288,452 | 2,019,161 | 10.77 |
| 5 | Onondaga | 7: Central New York | 1 | 30 | 835,889 | 278,630 | 1,950,408 | 10.40 |
| 6 | Ontario | 8: Western Finger Lakes | 1 | 4 | 586,184 | 195,395 | 1,367,764 | 7.29 |
| 7 | Columbia | 4: Capital Region/Northern Catskills | 1 | 17 | 484,193 | 161,398 | 1,129,784 | 6.03 |
| 8 | Rockland | 3: Lower Hudson Valley | 1 | 33 | 464,963 | 154,988 | 1,084,914 | 5.79 |
| 9 | Chautauqua | 9: Western New York | 2 | 39 | 423,784 | 141,261 | 988,830 | 5.27 |
| 10 | Steuben | 8: Western Finger Lakes | 1 | 37 | 260,070 | 86,690 | 606,832 | 3.24 |
| 11 | Putnam | 3: Lower Hudson Valley | 1 | 26 | 186,808 | 62,269 | 435,886 | 2.32 |
| 12 | Niagara | 9: Western New York | 1 | 17 | 67,494 | 22,498 | 157,488 | 0.84 |
| 13 | Tompkins | 7: Central New York | 1 | 25 | 64,955 | 21,652 | 151,564 | 0.81 |
| 14 | Livingston | 8: Western Finger Lakes | 1 | 17 | 19,913 | 6,638 | 46,465 | 0.25 |
| | | | 18 | 41 | 8,036,282 | 2,678,763 | 18,751,340 | 100% |

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3.4. Endocrine, Nutritional and Metabolic Diseases (E00-E90)

3.4a. Releases by Chemical

Fifty-one of the 70 chemicals released by NYS natural gas compressor stations are associated with endocrine, nutritional and metabolic disorders (ICD 10, Chapter 4).

All 18 stations reported such releases. These totaled an estimated 7.1 million pounds from 2008 to 2014--an annual average of slightly more than 1 million pounds a year.

Chemicals associated with these effects accounted for 17.8% of all reported natural gas compressor station releases.

VOCs were responsible for 4.9 million pounds or slightly more than two-thirds (68.1%) of all statewide releases. Formaldehyde ranked second (1.3 million pounds or 18.4%), followed by PM Condensable (540,267 pounds or 7.6%). These three chemicals accounted for 95.1% of all releases.

The top 5 chemicals were responsible for 98.7% of the state total.

Table 3.4a.

E00-E90: Endocrine, Nutritional and Metabolic Diseases by Chemical

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Chemical | | Location | | | 3 Years | 7 Year Estimate: 2008 to 2014 | | |
|----------|----------------------------|----------|------|-------|-----------|-------------------------------|-----------|-------|
| Rank | Name | Fac's | Cn's | Reg's | Pounds | Average | Pounds | % |
| 1 | Volatile Organic Compounds | 18 | 14 | 6 | 2,108,741 | 702,914 | 4,920,396 | 69.13 |
| 2 | Formaldehyde | 18 | 14 | 6 | 561,144 | 187,048 | 1,309,336 | 18.40 |
| 3 | PM Condensable | 18 | 14 | 6 | 231,543 | 77,181 | 540,267 | 7.59 |
| 4 | Sulfur Dioxide | 18 | 14 | 6 | 80,048 | 26,683 | 186,778 | 2.62 |
| 5 | Acetaldehyde | 14 | 13 | 6 | 28,272 | 9,424 | 65,969 | 0.93 |
| 6 | Benzene | 16 | 13 | 6 | 9,103 | 3,034 | 21,241 | 0.30 |
| 7 | Methanol | 8 | 7 | 6 | 8,286 | 2,762 | 19,333 | 0.27 |
| 8 | Toluene | 16 | 13 | 6 | 8,275 | 2,758 | 19,308 | 0.27 |
| 9 | Hexane | 13 | 10 | 6 | 5,222 | 1,741 | 12,184 | 0.17 |
| 10 | Xylenes (Mixed Isomers) | 15 | 13 | 6 | 3,598 | 1,199 | 8,394 | 0.12 |
| | | 18 | 14 | 6 | 3,044,231 | 1,014,744 | 7,103,205 | 99.80 |

3.4b. Releases by ICD Category

E00-E35: Forty-seven chemicals are associated with endocrine diseases. These include: adrenal weight change, androgen effects, delayed puberty, thymus weight changes, and thyroid hypofunction and other thyroid disorders.

E70-E90: Seventeen chemicals are associated with metabolic disorders. These include: biochemical and metabolic effects, homeostasis, hyperchloremic acidosis, and serum composition (changes: e.g. TP, bilirubin, cholesterol).

Table 3.04a.

E00-E90: Endocrine, Nutritional and Metabolic Diseases by ICD Category

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| ICD-10 | | | Facilities | | | | Chemicals | | | | Pounds | | | |
|--------|----------------|----------------------|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|----------------|------------------|------------------|------------------|
| # | Description | | '08 | '11 | '14 | Tot | '08 | '11 | '14 | Tot | 2008 | 2011 | 2014 | Total |
| 1 | E00-E35 | Endocrine diseases | 18 | 18 | 17 | 18 | 45 | 42 | 43 | 47 | 173,387 | 385,467 | 380,538 | 939,392 |
| 2 | E40-E68 | Nutritional diseases | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 | E70-E90 | Metabolic diseases | 18 | 17 | 16 | 18 | 17 | 17 | 17 | 17 | 120,072 | 258,769 | 240,402 | 619,243 |
| | E00-E90 | Total | 18 | 18 | 17 | 18 | 49 | 46 | 47 | 51 | 547,971 | 1,218,450 | 1,283,873 | 3,050,294 |

3.4c. Releases by Facility

All 18 natural gas compressor stations in NYS reported releasing these chemicals.

Four of the top 6 polluters were facilities operated by the Tennessee Gas Pipeline Company.

TGPC's Compressor Station 245 in Winfield ranked first with 1.3 million pounds (17.5%), followed by the Compressor Station 249 in Carlisle (948,972 pounds or 13.4%) and Compressor 241 in LaFayette (874,287 pounds or 12.2%). These three sites were responsible for 43% of all statewide releases.

The top 5 facilities were responsible for 61% of the total.

The facility average was 397,734 pounds.

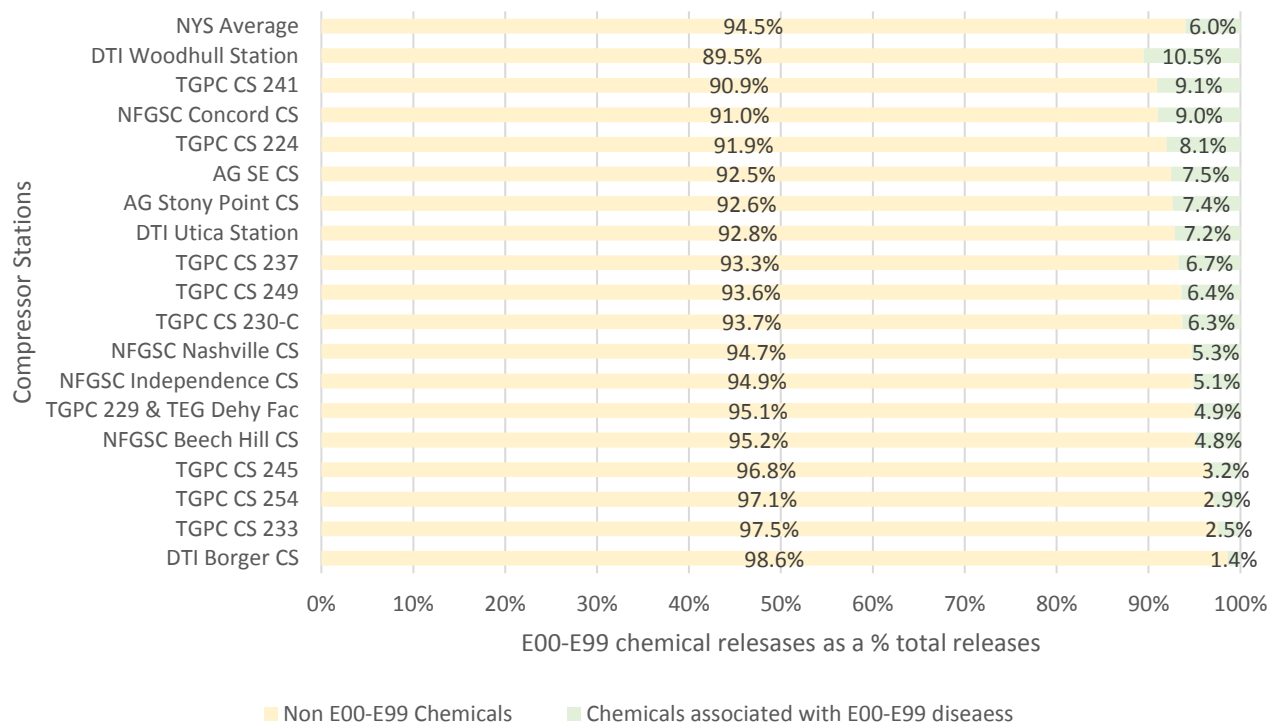
Table 3.4c.

Endocrine, Nutritional and Metabolic Diseases by Facility (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Facility | | Location | | Chemicals | | | 7 Years (estimate) | | |
|----------|-----------------------|--------------------|------------|-----------|-----------|-----------|--------------------|------------------|-------------|
| Rank | Facility Name (Short) | Town | County | '08 | '11 | '14 | Average | Tot. Lbs. | % |
| 1 | TGPC CS 245 | Winfield | Herkimer | 34 | 32 | 17 | 179,267 | 1,254,870 | 17.53 |
| 2 | TGPC CS 249 | Carlisle | Schoharie | 34 | 18 | 18 | 136,996 | 958,972 | 13.39 |
| 3 | TGPC CS 241 | LaFayette | Onondaga | 32 | 25 | 31 | 124,938 | 874,562 | 12.22 |
| 4 | AGT Stony Point CS | Stony Point | Rockland | 33 | 17 | 16 | 90,941 | 636,585 | 8.89 |
| 5 | TGPC 229 & TEG DF | Eden | Erie | 38 | 33 | 34 | 89,691 | 627,840 | 8.77 |
| 6 | TGPC CS 237 | Manchester, Phelps | Ontario | 5 | 4 | 3 | 76,433 | 535,028 | 7.47 |
| 7 | NFGSC Independence CS | Andover | Allegany | 10 | 5 | 12 | 53,498 | 374,487 | 5.23 |
| 8 | AGT SOUTHEAST CS | Southeast | Putnam | 20 | 13 | 37 | 48,166 | 337,165 | 4.71 |
| 9 | TGPC CS 254 | Chatham | Columbia | 20 | 11 | 5 | 40,522 | 283,651 | 3.96 |
| 10 | NFGSC Concord CS | Concord | Erie | 6 | 6 | 7 | 40,512 | 283,584 | 3.96 |
| 11 | DTI Woodhull Station | Woodhull | Steuben | 33 | 41 | 44 | 38,601 | 270,204 | 3.77 |
| 12 | TGPC CS 224 | Clymer | Chautauqua | 32 | 30 | 32 | 34,003 | 238,018 | 3.32 |
| 13 | NFGSC Beech Hill CS | Willing | Allegany | 14 | 14 | 15 | 28,685 | 200,796 | 2.80 |
| 14 | NFGSC Nashville CS | Hanover | Chautauqua | 29 | 27 | -- | 17,947 | 125,632 | 1.75 |
| 15 | DTI Utica Station | Frankfort | Herkimer | 29 | 33 | 43 | 10,601 | 74,209 | 1.04 |
| 16 | TGPC CS 230-C | Lockport | Niagara | 20 | 19 | 20 | 5,433 | 38,028 | 0.53 |
| 17 | DTI Borger CS | Ithaca | Tompkins | 33 | 34 | 13 | 5,354 | 37,476 | 0.52 |
| 18 | TGPC CS 233 | York | Livingston | 20 | 11 | 2 | 1,159 | 8,113 | 0.11 |
| | | | | 49 | 46 | 47 | 1,022,747 | 7,159,220 | 100% |

E00-E99 Chemicals as % of Each Compressor Station's Total Releases



3.4d. Releases by DEC Region

Six of New York State's nine DEC regions reported releases of chemicals associated with endocrine and metabolic diseases.

DEC Region 9, Western New York, ranked first with 1.8 million pounds (26%) from 2008 to 2014. Region 6, Western Adirondacks/Eastern Lake Ontario, ranked second with 1.3 million pounds (18.7%), closely followed by Region 3, Lower Hudson Valley, with 1.2 million pounds (17.5%).

Table 3.4d.

E00-E90: Endocrine, Nutritional and Metabolic Diseases by DEC Region (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| | | County | | 3 Years: 2008, 2011, 2014 | | | 7-Year Estimate: 2008-2014 | | |
|------|---------------------------------|------------|------|---------------------------|------|--------------|----------------------------|--------------|-------|
| Rank | NYS DEC Region | Name | Rank | Fac's | Ch's | Total Pounds | Average Pounds | Total Pounds | % |
| 1 | 9: Western New York | Allegany | 6 | 2 | 15 | 246,550 | 82,183 | 575,284 | 8.08 |
| | | Chautauqua | 9 | 2 | 45 | 137,903 | 45,968 | 321,773 | 4.52 |
| | | Erie | 3 | 2 | 40 | 390,611 | 130,204 | 911,425 | 12.81 |
| | | Niagara | 12 | 1 | 20 | 16,298 | 5,433 | 38,028 | 0.53 |
| | | | | 7 | 49 | 791,362 | 263,787 | 1,846,511 | 25.94 |
| | | | | | | | | | |
| 2 | 6: W Adirondacks/E Lake Ontario | Herkimer | 1 | 2 | 50 | 569,606 | 189,869 | 1,329,080 | 18.67 |
| | | | | | | | | | |
| 3 | 4: Capital Region/N. Catskills | Columbia | 10 | 1 | 20 | 121,565 | 40,522 | 283,651 | 3.99 |
| | | Schoharie | 2 | 1 | 34 | 410,988 | 136,996 | 958,972 | 13.47 |
| | | | | 2 | 39 | 532,553 | 177,518 | 1,242,624 | 17.46 |
| | | | | | | | | | |
| 6 | 3: Lower Hudson Valley | Putnam | 8 | 1 | 37 | 144,499 | 48,166 | 337,165 | 4.74 |
| | | Rockland | 5 | 1 | 35 | 272,822 | 90,941 | 636,585 | 8.94 |
| | | | | 2 | 45 | 417,322 | 139,107 | 973,751 | 13.68 |
| | | | | | | | | | |
| 4 | 7: Central New York | Onondaga | 4 | 1 | 32 | 374,813 | 124,938 | 874,563 | 12.29 |
| | | Tompkins | 13 | 1 | 36 | 16,061 | 5,354 | 37,476 | 0.53 |
| | | | | 2 | 49 | 390,874 | 130,291 | 912,039 | 12.81 |
| | | | | | | | | | |
| 5 | 8: Western Finger Lakes | Livingston | 14 | 1 | 20 | 3,477 | 1,159 | 8,114 | 0.11 |
| | | Ontario | 7 | 1 | 5 | 229,298 | 76,433 | 535,029 | 7.52 |
| | | Steuben | 11 | 1 | 46 | 115,802 | 38,601 | 270,204 | 3.80 |
| | | | | 3 | 46 | 348,577 | 116,192 | 813,347 | 11.43 |
| | | | | | | | | | |
| | | | | 18 | 51 | 3,050,294 | 1,016,765 | 7,117,352 | 100 |

3.4e. Releases by County

All fourteen counties where compressor stations are located reported releases of chemicals linked to endocrine and metabolic disorders.

Herkimer County ranked first with 1.3 million pounds or 18.7% of the state total, followed by Schoharie County (958,972 pounds or 13.5%) and Erie County (911,425 pounds or 12.8%). These three counties are responsible for nearly one-half (45%) of all releases.

The top five counties were responsible for 12.8 million pounds or slightly less than two-thirds (66.2%) of the state total.

The 14-county average was 508,382 pounds.

Table 3.4e.

E00-E90: Endocrine, Nutritional and Metabolic Diseases by County (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Rank | County | NYS DEC Region | 3 Years: 2008, 2011, 2014 | | | 7-Year Estimate: 2008-2014 | | |
|------|------------|--|---------------------------|-----------|------------------|----------------------------|------------------|-------------|
| | | | Fac's | Ch's | Total Pounds | Average Pounds | Total Pounds | % |
| 1 | Herkimer | 6: Western Adirondacks/E. Lake Ontario | 2 | 50 | 569,605 | 189,868 | 1,329,080 | 18.67 |
| 2 | Schoharie | 4: Capital Region/Northern Catskills | 1 | 34 | 410,988 | 136,996 | 958,972 | 13.47 |
| 3 | Erie | 9: Western New York | 2 | 40 | 390,610 | 130,203 | 911,425 | 12.81 |
| 4 | Onondaga | 7: Central New York | 1 | 32 | 374,812 | 124,937 | 874,562 | 12.29 |
| 5 | Rockland | 3: Lower Hudson Valley | 1 | 35 | 272,822 | 90,940 | 636,585 | 8.94 |
| 6 | Allegany | 9: Western New York | 2 | 15 | 246,550 | 82,183 | 575,283 | 8.08 |
| 7 | Ontario | 8: Western Finger Lakes | 1 | 5 | 229,298 | 76,432 | 535,028 | 7.52 |
| 8 | Putnam | 3: Lower Hudson Valley | 1 | 37 | 144,499 | 48,166 | 337,165 | 4.74 |
| 9 | Chautauqua | 9: Western New York | 2 | 45 | 137,902 | 45,967 | 321,773 | 4.52 |
| 10 | Columbia | 4: Capital Region/Northern Catskills | 1 | 20 | 121,564 | 40,521 | 283,651 | 3.99 |
| 11 | Steuben | 8: Western Finger Lakes | 1 | 46 | 115,801 | 38,600 | 270,204 | 3.80 |
| 12 | Niagara | 9: Western New York | 1 | 20 | 16,297 | 5,432 | 38,028 | 0.53 |
| 13 | Tompkins | 7: Central New York | 1 | 36 | 16,061 | 5,353 | 37,476 | 0.53 |
| 14 | Livingston | 8: Western Finger Lakes | 1 | 20 | 3,477 | 1,159 | 8,113 | 0.11 |
| | | | 18 | 50 | 3,050,286 | 1,016,757 | 7,117,345 | 100% |

3.5. Mental and Behavioral Disorders (F00-F99)

3.5a. Releases by Chemical

Thirty-four of the 70 chemicals released by NYS natural gas compressor reported to NEI are associated with mental and behavioral disorders (ICD-10, Chapter 5).

All 18 stations reported such releases. These totaled an estimated 18.7 million pounds from 2008 to 2014--an annual average of 2.7 million pounds.

Chemicals associated with mental and behavioral disorders represented 47% of all reported toxic releases reported from natural gas compressor stations reported to NEI.

Carbon monoxide was responsible for almost two-thirds (65.9%) of statewide releases of mental and behavioral system toxicants. Volatile organic compounds as a group ranked second (4.9 million pounds or 26.3%), followed by formaldehyde (1.3 million pounds or 7%). These three chemicals accounted for 99.96% of the state total.

Table 3.5a.

F00-F99: Mental and Behavioral Disorders by Chemical

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Chemical | | Location | | | 3 Years | 7 Year Estimate: 2008 to 2014 | | |
|----------|----------------------------|----------|------|-------|-----------|-------------------------------|------------|-------|
| Rank | Name | Fac's | Cn's | Reg's | Pounds | Average | Pounds | % |
| 1 | Carbon Monoxide | 18 | 14 | 6 | 5,297,028 | 1,765,676 | 12,359,731 | 65.93 |
| 2 | Volatile Organic Compounds | 18 | 14 | 6 | 2,108,741 | 702,914 | 4,920,396 | 26.25 |
| 3 | Formaldehyde | 18 | 14 | 6 | 561,144 | 187,048 | 1,309,336 | 6.98 |
| 4 | Acetaldehyde | 14 | 13 | 6 | 28,272 | 9,424 | 65,969 | 0.35 |
| 5 | Benzene | 16 | 13 | 6 | 9,103 | 3,034 | 21,241 | 0.11 |
| 6 | Methanol | 8 | 7 | 6 | 8,286 | 2,762 | 19,333 | 0.10 |
| 7 | Toluene | 16 | 13 | 6 | 8,275 | 2,758 | 19,308 | 0.10 |
| 8 | Hexane | 13 | 10 | 6 | 5,222 | 1,741 | 12,184 | 0.06 |
| 9 | Xylenes (Mixed Isomers) | 15 | 13 | 6 | 3,598 | 1,199 | 8,394 | 0.04 |
| 10 | Ethyl Benzene | 15 | 13 | 6 | 1,198 | 399 | 2,794 | 0.01 |
| | | 18 | 14 | 6 | 8,030,865 | 2,676,955 | 18,738,685 | 99.96 |

3.5b. Releases by ICD Category

Mental and behavioral disorders are divided into 11 major groups.

Chemicals released by natural gas compressor stations are positively associated with 8 of them. It should be remembered that a single chemical can be associated with more than one disease group.

F00-F09: Ten chemicals are associated with organic, including symptomatic, mental disorders. Specific effects associated with these eight chemicals include euphoria, hallucinations, mood disturbance, and personality changes. These chemicals were released by all 18 facilities.

F20-F29: Two chemicals, carbon monoxide and mercury, are associated with schizophrenia, schizotypal and delusional disorders, including delusions and psychosis (manic depressive). These chemicals were released by all 18 facilities.

F30-F39: Thirteen chemicals are associated with mood (affective) disorders. Excitement and depression are the two specific effects found in the peer-reviewed literature. These chemicals were released by all 18 facilities.

F40-F48: Twelve chemicals are associated with neurotic, stress-related and somatoform disorders, including anxiety, incoordination, panic attacks and stupor. These chemicals were released by all 18 facilities.

F50-F59: Nineteen chemicals are connected to behavioral syndromes associated with physiological disturbances and physical factors, specifically, aimless wandering behavior, anorexia (loss of appetite), mental alertness and unspecified behavioral effects. These chemicals were released by all 18 facilities.

F60-F69: Two chemicals are associated with disorders of adult personality and behavior, specifically, aggression. Releases were reported by all 18 compressor stations.

F80-F89: Seven chemicals are connected to disorders of adult personality and behavior, including learning ability, decrease in manual dexterity and reduced cognitive capacity. These chemicals were released by all 18 facilities.

F99: Seven chemicals are associated with unspecified mental disorders.

Table 3.5b.

Mental and Behavioral Disorders by ICD Category

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| ICD-10 | | | Facilities | | | | Chemicals | | | | Pounds | | | |
|----------------------|-------------|--|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------------|------------------|------------------|------------------|
| # | Description | | '08 | '11 | '14 | Tot | '08 | '11 | '14 | Tot | 2008 | 2011 | 2014 | Total |
| 1 | F00-F09 | Organic, including symptomatic, mental disorders | 18 | 18 | 17 | 18 | 10 | 10 | 10 | 10 | 1,418,739 | 2,038,854 | 1,856,547 | 5,314,142 |
| 2 | F10-F19 | Mental and behavioral disorders due to psychoactive substance use | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 | F20-F29 | Schizophrenia, schizotypal and delusional disorders | 18 | 18 | 17 | 18 | 2 | 2 | 2 | 2 | 1,416,012 | 2,030,636 | 1,850,408 | 5,297,057 |
| 4 | F30-F39 | Mood (affective) disorders | 18 | 18 | 17 | 18 | 13 | 13 | 13 | 13 | 1,530,052 | 2,267,329 | 2,075,954 | 5,873,337 |
| 5 | F40-F48 | Neurotic, stress-related and somatoform disorders | 18 | 18 | 17 | 18 | 12 | 12 | 12 | 12 | 1,792,142 | 2,868,481 | 2,758,797 | 7,419,420 |
| 6 | F50-F59 | Behavioral syndromes associated with physiological disturbances and physical factors | 18 | 18 | 16 | 18 | 19 | 19 | 19 | 19 | 119,618 | 255,264 | 237,598 | 612,481 |
| 7 | F60-F69 | Disorders of adult personality and behavior | 18 | 18 | 17 | 18 | 2 | 2 | 2 | 2 | 1,526,329 | 2,260,511 | 2,071,330 | 5,858,171 |
| 8 | F70-F79 | Mental retardation | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9 | F80-F89 | Disorders of psychological development | 18 | 18 | 17 | 18 | 7 | 7 | 7 | 7 | 377,778 | 839,518 | 909,277 | 2,126,574 |
| 10 | F90-F98 | Behavioral and emotional disorders with onset usually occurring in childhood and adolescence | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11 | F99 | Unspecified mental disorder | 18 | 18 | 17 | 18 | 7 | 7 | 7 | 7 | 377,778 | 839,518 | 909,277 | 2,126,574 |
| F00-F99 Total | | | 18 | 18 | 17 | 18 | 34 | 34 | 34 | 34 | 1,913,000 | 3,124,461 | 2,996,664 | 8,034,126 |

3.5c. Releases by Facility

All 18 natural gas compressor stations in NYS reported releasing chemicals associated with mental and behavioral disorders,

The top 6 polluters were facilities operated by the Tennessee Gas Pipeline Company.

TGPC's Compressor Station 245 in Winfield ranked first with 4.1 million pounds (22%), followed by Compressor Station 249 in Carlisle (2.1 million pounds or 11.1%) and Compressor 241 in LaFayette (2 million pounds or 10.3%). These three sites were responsible for 43% of all statewide releases.

The top 5 facilities were responsible for 58% of the total.

The facility average was 1,048,493 pounds.

Table 3.5c

Mental and Behavioral Disorders by Facility (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Facility | | Location | | Chemicals | | | 7 Years (estimate) | | |
|----------|-----------------------|--------------------|------------|-----------|-----|-----|--------------------|------------|-------|
| Rank | Facility Name (Short) | Town | County | '08 | '11 | '14 | Average | Tot. Lbs. | % |
| 1 | TGPC CS 245 | Winfield | Herkimer | 27 | 27 | 16 | 580,710 | 4,064,973 | 21.54 |
| 2 | TGPC CS 249 | Carlisle | Schoharie | 27 | 17 | 17 | 299,178 | 2,094,247 | 11.10 |
| 3 | TGPC CS 241 | LaFayette | Onondaga | 26 | 19 | 26 | 278,597 | 1,950,179 | 10.33 |
| 4 | TGPC 229 & TEG DF | Eden | Erie | 24 | 23 | 24 | 222,733 | 1,559,128 | 8.26 |
| 5 | TGPC CS 237 | Manchester, Phelps | Ontario | 4 | 3 | 3 | 195,395 | 1,367,764 | 7.25 |
| 6 | TGPC CS 254 | Chatham | Columbia | 16 | 10 | 4 | 161,398 | 1,129,784 | 5.99 |
| 7 | AGT Stony Point CS | Stony Point | Rockland | 28 | 14 | 15 | 154,888 | 1,084,216 | 5.74 |
| 8 | NFGSC Independ. CS | Andover | Allegany | 10 | 5 | 12 | 147,748 | 1,034,239 | 5.48 |
| 9 | NFGSC Beech Hill CS | Willing | Allegany | 13 | 13 | 14 | 140,703 | 984,922 | 5.22 |
| 10 | NFGSC Concord CS | Concord | Erie | 6 | 5 | 7 | 133,625 | 935,372 | 4.96 |
| 11 | TGPC CS 224 | Clymer | Chautauqua | 27 | 25 | 27 | 105,039 | 735,270 | 3.90 |
| 12 | DTI Woodhull Station | Woodhull | Steuben | 20 | 28 | 30 | 86,571 | 605,996 | 3.21 |
| 13 | AGT SOUTHEAST CS | Southeast | Putnam | 16 | 11 | 19 | 62,261 | 435,829 | 2.31 |
| 14 | NFGSC Nashville CS | Hanover | Chautauqua | 16 | 16 | 0 | 54,249 | 379,740 | 2.01 |
| 15 | TGPC CS 230-C | Lockport | Niagara | 16 | 15 | 16 | 22,498 | 157,487 | 0.83 |
| 16 | DTI Utica Station | Frankfort | Herkimer | 16 | 18 | 30 | 22,243 | 155,702 | 0.83 |
| 17 | DTI Borger CS | Ithaca | Tompkins | 20 | 20 | 12 | 21,652 | 151,563 | 0.80 |
| 18 | TGPC CS 233 | York | Livingston | 16 | 10 | 2 | 6,638 | 46,464 | 0.25 |
| | | | | 34 | 34 | 34 | 2,696,125 | 18,872,875 | 100% |

Table 3.5c.2.

Mental and Behavioral Disorders as a % of Each Station's Total Releases

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Rank | Identification | Location | | Pounds | | | Percent | |
|------|-----------------------|--------------------|------------|-------------------|-------------------|------------------|-------------|-------------|
| | Facility Name (Short) | Town | County | Total | Non-F00-F99 | F00-F99 | Non-F00-F99 | F00-F99 |
| 1 | DTI Woodhull Station | Woodhull | Steuben | 829,223 | 559,019 | 270,204 | 67.4 | 32.6 |
| 2 | AGT Stony Point CS | Stony Point | Rockland | 2,013,478 | 1,376,893 | 636,585 | 68.4 | 31.6 |
| 3 | TGPC CS 241 | LaFayette | Onondaga | 3,039,661 | 2,165,099 | 874,563 | 71.2 | 28.8 |
| 4 | NFGSC Independence CS | Andover | Allegany | 1,353,931 | 979,444 | 374,488 | 72.3 | 27.7 |
| 5 | DTI Utica Station | Frankfort | Herkimer | 281,369 | 207,160 | 74,209 | 73.6 | 26.4 |
| 6 | TGPC CS 237 | Manchester, Phelps | Ontario | 2,298,394 | 1,763,365 | 535,029 | 76.7 | 23.3 |
| 7 | TGPC CS 249 | Carlisle | Schoharie | 4,323,285 | 3,364,313 | 958,972 | 77.8 | 22.2 |
| 8 | TGPC CS 224 | Clymer | Chautauqua | 1,146,797 | 908,779 | 238,018 | 79.2 | 20.8 |
| 9 | NFGSC Nashville CS | Hanover | Chautauqua | 622,791 | 497,159 | 125,632 | 79.8 | 20.2 |
| 10 | AGT SOUTHEAST CS | Southeast | Putnam | 1,688,815 | 1,351,650 | 337,165 | 80.0 | 20.0 |
| 11 | NFGSC Concord CS | Concord | Erie | 1,733,171 | 1,449,586 | 283,585 | 83.6 | 16.4 |
| 12 | NFGSC Beech Hill CS | Willing | Allegany | 1,387,592 | 1,186,796 | 200,796 | 85.5 | 14.5 |
| 13 | TGPC 229 & TEG DF | Eden | Erie | 5,124,427 | 4,496,586 | 627,840 | 87.7 | 12.3 |
| 14 | TGPC CS 245 | Winfield | Herkimer | 10,465,389 | 9,210,518 | 1,254,871 | 88.0 | 12.0 |
| 15 | TGPC CS 254 | Chatham | Columbia | 2,393,661 | 2,110,010 | 283,651 | 88.1 | 11.9 |
| 16 | TGPC CS 230-C | Lockport | Niagara | 485,610 | 447,581 | 38,028 | 92.2 | 7.8 |
| 17 | DTI Borger CS | Ithaca | Tompkins | 780,159 | 742,683 | 37,476 | 95.2 | 4.8 |
| 18 | TGPC CS 233 | York | Livingston | 224,978 | 216,865 | 8,114 | 96.4 | 3.6 |
| | | | | 40,192,733 | 33,033,504 | 7,159,229 | 82.2 | 17.8 |

3.5d. Releases by DEC Regions

The 18 compressor stations analyzed are in 6 of New York's 9 DEC regions. All 6 regions had releases of chemicals associated with mental and behavioral disorders.

DEC Region 9, Western New York, ranked first with 5.7 million pounds or slightly less than one-third of total releases from 2008 to 2014. Region 6, Western Adirondacks/Eastern Lake Ontario, second with 4.2 million pounds (22.5%), followed by Region 4, Capital Region/Northern Catskills, 3.2 million pounds (17.2%).

Table 3.5d.

Mental and Behavioral Disorders by DEC Region (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Rank | NYS DEC Region | County | | 3 Years: 2008, 2011, 2014 | | | 7-Year Estimate: 2008-2014 | | |
|------|----------------------------------|------------|------|---------------------------|------|--------------|----------------------------|--------------|-------|
| | | Name | Rank | Fac's | Ch's | Total Pounds | Average Pounds | Total Pounds | % |
| 1 | 9: Western New York | Allegany | 4 | 2 | 15 | 865,355 | 288,452 | 2,019,161 | 10.77 |
| | | Chautauqua | 9 | 2 | 33 | 423,613 | 141,204 | 988,430 | 5.27 |
| | | Erie | 2 | 2 | 27 | 1,069,071 | 356,357 | 2,494,500 | 13.31 |
| | | Niagara | 12 | 1 | 16 | 67,494 | 22,498 | 157,487 | 0.84 |
| | | | | 7 | 34 | 2,425,533 | 808,511 | 5,659,578 | 30.19 |
| 2 | 6: W. Adirondacks/E Lake Ontario | Herkimer | 1 | 2 | 33 | 1,808,861 | 602,954 | 4,220,675 | 22.51 |
| | | | | | | | | | |
| 3 | 4: Capital Region/N. Catskills | Columbia | 7 | 1 | 16 | 484,193 | 161,398 | 1,129,784 | 6.03 |
| | | Schoharie | 3 | 1 | 27 | 897,534 | 299,178 | 2,094,247 | 11.17 |
| | | | | 2 | 31 | 1,381,727 | 460,576 | 3,224,031 | 17.20 |
| 4 | 7: Central New York | Onondaga | 5 | 1 | 26 | 835,791 | 278,597 | 1,950,179 | 10.40 |
| | | Tompkins | 13 | 1 | 20 | 64,956 | 21,652 | 151,563 | 0.81 |
| | | | | 2 | 34 | 900,747 | 300,249 | 2,101,742 | 11.21 |
| 5 | 8: Western Finger Lakes | Livingston | 14 | 1 | 16 | 19,913 | 6,638 | 46,464 | 0.25 |
| | | Ontario | 6 | 1 | 4 | 586,185 | 195,395 | 1,367,764 | 7.30 |
| | | Steuben | 10 | 1 | 31 | 259,713 | 86,571 | 605,996 | 3.23 |
| | | | | 3 | 31 | 865,810 | 288,603 | 2,020,224 | 10.78 |
| 6 | 3: Lower Hudson Valley | Putnam | 11 | 1 | 21 | 186,784 | 62,261 | 435,829 | 2.32 |
| | | Rockland | 8 | 1 | 28 | 464,664 | 154,888 | 1,084,216 | 5.78 |
| | | | | 2 | 32 | 651,448 | 217,149 | 1,520,044 | 8.11 |
| | | | | 18 | 34 | 8,034,126 | 2,678,042 | 18,746,295 | 100% |

3.5e. Releases by County

All fourteen counties where compressor stations are located reported releases of chemicals linked to mental and behavioral disorders.

Herkimer County ranked first with 4.2 million pounds or 22.5% of the state total, followed by Erie County (2.5 million pounds or 13.3%) and Schoharie County (2 million pounds or 11.2%). These three counties are responsible for nearly one-half (47%) of all releases.

The top five counties were responsible for 12.8 million pounds or slightly more than two-thirds (68.1%) of the state total.

The 14-county average was 1,339,021 pounds.

Table 3.5e.

Mental and Behavioral Disorders by County (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Rank | County | NYS DEC Region | 3 Years: 2008, 2011, 2014 | | | 7-Year Estimate: 2008-2014 | | |
|------|------------|--|---------------------------|-----------|------------------|----------------------------|-------------------|-------------|
| | | | Fac's | Ch's | Total Pounds | Average Pounds | Total Pounds | % |
| 1 | Herkimer | 6: Western Adirondacks/E. Lake Ontario | 2 | 33 | 1,808,861 | 602,954 | 4,220,675 | 22.51 |
| 2 | Erie | 9: Western New York | 2 | 27 | 1,069,071 | 356,357 | 2,494,500 | 13.31 |
| 3 | Schoharie | 4: Capital Region/Northern Catskills | 1 | 27 | 897,534 | 299,178 | 2,094,247 | 11.17 |
| 4 | Allegany | 9: Western New York | 2 | 15 | 865,355 | 288,452 | 2,019,161 | 10.77 |
| 5 | Onondaga | 7: Central New York | 1 | 26 | 835,791 | 278,597 | 1,950,179 | 10.40 |
| 6 | Ontario | 8: Western Finger Lakes | 1 | 4 | 586,185 | 195,395 | 1,367,764 | 7.30 |
| 7 | Columbia | 4: Capital Region/Northern Catskills | 1 | 16 | 484,193 | 161,398 | 1,129,784 | 6.03 |
| 8 | Rockland | 3: Lower Hudson Valley | 1 | 28 | 464,664 | 154,888 | 1,084,216 | 5.78 |
| 9 | Chautauqua | 9: Western New York | 2 | 33 | 423,613 | 141,204 | 988,430 | 5.27 |
| 10 | Steuben | 8: Western Finger Lakes | 1 | 31 | 259,713 | 86,571 | 605,996 | 3.23 |
| 11 | Putnam | 3: Lower Hudson Valley | 1 | 21 | 186,784 | 62,261 | 435,829 | 2.32 |
| 12 | Niagara | 9: Western New York | 1 | 16 | 67,494 | 22,498 | 157,487 | 0.84 |
| 13 | Tompkins | 7: Central New York | 1 | 20 | 64,956 | 21,652 | 151,563 | 0.81 |
| 14 | Livingston | 8: Western Finger Lakes | 1 | 16 | 19,913 | 6,638 | 46,464 | 0.25 |
| | | | 18 | 34 | 8,034,126 | 2,678,042 | 18,746,295 | 100% |

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3.6. Diseases of the Nervous System (G00–G99)

3.6a. Releases by Chemical

Forty-two of the 70 chemicals released by NYS natural gas compressor stations are associated with nervous system disorders (ICD-10, Chapter 6). All 18 stations reported such releases. These totaled an estimated 19 million pounds from 2008 to 2014--an annual average of 2.7 million pounds.

Chemicals associated with nervous system diseases represent 47.6% of all reported toxic releases from NYS natural gas compressor stations reported to NEI.

Carbon monoxide was responsible for almost two-thirds (65.1%) of statewide releases of nervous system toxicants. Volatile organic compounds as a group ranked second (4.9 million pounds or 26%), followed by formaldehyde (1.3 million pounds or 6.9%). These three chemicals accounted for 97.9% of the state total.

Table 3.6a.

Diseases of the Nervous System by Chemical

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Chemical | | Location | | | 3 Years | 7 Year Estimate: 2008 to 2014 | | |
|----------|----------------------------|----------|------|-------|-----------|-------------------------------|------------|-------|
| Rank | Name | Fac's | Cn's | Reg's | Pounds | Average | Pounds | % |
| 1 | Carbon Monoxide | 18 | 14 | 6 | 5,297,028 | 1,765,676 | 12,359,731 | 65.08 |
| 2 | Volatile Organic Compounds | 18 | 14 | 6 | 2,108,741 | 702,914 | 4,920,396 | 25.91 |
| 3 | Formaldehyde | 18 | 14 | 6 | 561,144 | 187,048 | 1,309,336 | 6.89 |
| 4 | Sulfur Dioxide | 18 | 14 | 6 | 80,048 | 26,683 | 186,778 | 0.98 |
| 5 | Acetaldehyde | 14 | 13 | 6 | 28,272 | 9,424 | 65,969 | 0.35 |
| 6 | Acrolein | 14 | 13 | 6 | 22,596 | 7,532 | 52,723 | 0.28 |
| 7 | Benzene | 16 | 13 | 6 | 9,103 | 3,034 | 21,241 | 0.11 |
| 8 | Methanol | 8 | 7 | 6 | 8,286 | 2,762 | 19,333 | 0.10 |
| 9 | Toluene | 16 | 13 | 6 | 8,275 | 2,758 | 19,308 | 0.10 |
| 10 | Hexane | 13 | 10 | 6 | 5,222 | 1,741 | 12,184 | 0.06 |
| | | 18 | 14 | 6 | 8,128,714 | 2,709,571 | 18,966,998 | 99.87 |

3.6b. Releases by ICD Category

Diseases of the nervous system are subdivided into 11 major categories.

Chemicals released by natural gas compressor stations are positively associated with 6 of them. It should be remembered that a single chemical can be associated with more than one disease group.

G00-G09: Five chemicals are associated with inflammatory diseases of the central nervous system, specifically, amyotrophic lateral sclerosis. These chemicals were released by all 18 stations.

G20-G26: Two chemicals are associated with extrapyramidal and movement disorders, specifically, olfactory nerve changes. These chemicals were released by 8 stations.

G40-G47: Ten chemicals are associated with episodic and paroxysmal disorders, specifically, altered sleep time (including change in righting reflex), insomnia, peripheral nerve effects, sleep disorders, and sleepiness. These chemicals were released by 17 stations.

G60-G64: Two chemicals are associated with polyneuropathies and other disorders of the peripheral nervous system. These chemicals were released by all 18 stations.

G80-G83: One chemical, carbon monoxide, is associated with cerebral palsy and other paralytic syndromes. It is released by all stations.

G90-G99: Forty-two chemicals are associated with other disorders of the nervous system.

Table 3.6b.

G00-G99: Diseases of the Nervous System by ICD Code Group

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| ICD-10 | | | Facilities | | | | Chemicals | | | | Pounds | | | |
|--------|----------------|---|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------------|------------------|------------------|------------------|
| # | Description | | '08 | '11 | '14 | Tot | '08 | '11 | '14 | Tot | 2008 | 2011 | 2014 | Total |
| 1 | G00-G09 | Inflammatory diseases of the central nervous system | 18 | 18 | 16 | 18 | 5 | 5 | 5 | 5 | 112,281 | 231,662 | 222,434 | 566,378 |
| 2 | G10-G13 | Systemic atrophies primarily affecting the central nervous system | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 | G20-G26 | Extrapyramidal and movement disorders | 6 | 4 | 5 | 8 | 2 | 2 | 2 | 2 | 41 | 108 | 70 | 220 |
| 4 | G30-G32 | Other degenerative diseases of the nervous system | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | G40-G47 | Episodic and paroxysmal disorders | 17 | 16 | 14 | 17 | 10 | 10 | 10 | 10 | 7,391 | 23,902 | 15,437 | 46,732 |
| 6 | G50-G59 | Nerve, nerve root and plexus disorders | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7 | G60-G64 | Polyneuropathies and other disorders of the peripheral nervous sys. | 18 | 17 | 16 | 18 | 2 | 2 | 2 | 2 | 110,351 | 229,931 | 220,960 | 561,243 |
| 8 | G70-G73 | Diseases of myoneural junction and muscle | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9 | G80-G83 | Cerebral palsy and other paralytic syndromes | 18 | 18 | 17 | 18 | 1 | 1 | 1 | 1 | 1,415,995 | 2,030,629 | 1,850,402 | 5,297,027 |
| 10 | G90-G99 | Other disorders of the nervous system | 18 | 18 | 17 | 18 | 42 | 42 | 42 | 42 | 1,924,189 | 3,151,601 | 3,063,418 | 8,139,210 |
| | G00-G99 | Total | 18 | 18 | 17 | 18 | 42 | 42 | 42 | 42 | 1,924,189 | 3,151,601 | 3,063,418 | 8,139,210 |

3.6c. Releases by Facility

All 18 natural gas compressor stations in NYS reported releasing chemicals associated with nervous system disorders.

The top 6 polluters were facilities operated by the Tennessee Gas Pipeline Company.

TGPC's Compressor Station 245 in Winfield ranked first with 4.1 million pounds (22%), followed by Compressor Station 249 in Carlisle (2.1 million pounds or 11.1%) and Compressor 241 in LaFayette (2 million pounds or 10.3%). These three sites were responsible for 43% of all statewide releases.

The top 5 facilities were responsible for 58% of the total.

The facility average was 1,062,124 pounds.

Table 3.6c.

G00–G99: Diseases of the Nervous System by Facility (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Facility | | Location | | Chemicals | | | 7 Years (estimate) | | |
|----------|-----------------------|--------------------|------------|-----------|-----|-----|--------------------|------------|-------|
| Rank | Facility Name (Short) | Town | County | '08 | '11 | '14 | Average | Tot. Lbs. | % |
| 1 | TGPC CS 245 | Winfield | Herkimer | 34 | 34 | 20 | 584,742 | 4,093,196 | 21.41 |
| 2 | TGPC CS 249 | Carlisle | Schoharie | 34 | 21 | 21 | 303,242 | 2,122,694 | 11.10 |
| 3 | TGPC CS 241 | LaFayette | Onondaga | 33 | 23 | 33 | 282,459 | 1,977,209 | 10.34 |
| 4 | TGPC 229 & TEG DF | Eden | Erie | 31 | 30 | 31 | 227,683 | 1,593,779 | 8.34 |
| 5 | TGPC CS 237 | Manchester, Phelps | Ontario | 5 | 4 | 4 | 195,580 | 1,369,060 | 7.16 |
| 6 | TGPC CS 254 | Chatham | Columbia | 19 | 12 | 5 | 162,516 | 1,137,610 | 5.95 |
| 7 | AGT Stony Point CS | Stony Point | Rockland | 36 | 17 | 18 | 159,633 | 1,117,432 | 5.84 |
| 8 | NFGSC Independence CS | Andover | Allegany | 11 | 6 | 13 | 147,851 | 1,034,958 | 5.41 |
| 9 | NFGSC Beech Hill CS | Willing | Allegany | 16 | 16 | 17 | 141,024 | 987,167 | 5.16 |
| 10 | NFGSC Concord CS | Concord | Erie | 7 | 6 | 8 | 133,787 | 936,510 | 4.90 |
| 11 | TGPC CS 224 | Clymer | Chautauqua | 34 | 32 | 34 | 106,266 | 743,864 | 3.89 |
| 12 | DTI Woodhull Station | Woodhull | Steuben | 24 | 32 | 36 | 87,890 | 615,229 | 3.22 |
| 13 | AGT SOUTHEAST CS | Southeast | Putnam | 19 | 14 | 24 | 67,069 | 469,483 | 2.46 |
| 14 | NFGSC Nashville CS | Hanover | Chautauqua | 18 | 18 | 0 | 54,319 | 380,234 | 1.99 |
| 15 | TGPC CS 230-C | Lockport | Niagara | 19 | 18 | 19 | 25,460 | 178,217 | 0.93 |
| 16 | DTI Utica Station | Frankfort | Herkimer | 18 | 22 | 35 | 22,575 | 158,022 | 0.83 |
| 17 | DTI Borger CS | Ithaca | Tompkins | 24 | 24 | 15 | 22,343 | 156,403 | 0.82 |
| 18 | TGPC CS 233 | York | Livingston | 19 | 12 | 3 | 6,737 | 47,157 | 0.25 |
| | | | | 42 | 42 | 42 | 2,731,176 | 19,118,224 | 100% |

3.6d. Releases by DEC Region

The 18 compressor stations analyzed are in 6 of New York's 9 DEC regions. All 6 regions had releases of chemicals associated with mental and nervous system disorders.

DEC Region 9, Western New York, ranked first with 5.7 million pounds or slightly less than one-third (30.2%) of total releases from 2008 to 2014. Region 6, Western Adirondacks/Eastern Lake Ontario, second with 4.3 million pounds (22.4%), followed by Region 4, Capital Region/Northern Catskills, 3.3 million pounds (17.2%).

Table 3.6d.

G00–G99: Diseases of the Nervous System by DEC Region (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Rank | NYS DEC Region | County | | 3 Years: 2008, 2011, 2014 | | | 7-Year Estimate: 2008-2014 | | |
|------|---------------------------------|------------|------|---------------------------|------|--------------|----------------------------|--------------|-------|
| | | Name | Rank | Fac's | Ch's | Total Pounds | Average Pounds | Total Pounds | % |
| 1 | 9: Western New York | Allegany | 4 | 2 | 18 | 866,625 | 288,875 | 2,022,126 | 10.65 |
| | | Chautauqua | 9 | 2 | 41 | 427,437 | 142,479 | 997,353 | 5.25 |
| | | Erie | 2 | 2 | 34 | 1,084,410 | 361,470 | 2,530,290 | 13.32 |
| | | Niagara | 12 | 1 | 19 | 76,379 | 25,459 | 178,217 | 0.94 |
| | | | | 7 | 42 | 2,454,851 | 818,283 | 5,727,986 | 30.16 |
| 2 | 6: W Adirondacks/E Lake Ontario | Herkimer | 1 | 2 | 41 | 1,821,950 | 607,316 | 4,251,218 | 22.38 |
| | | | | | | | | | |
| 3 | 4: Capital Region/N. Catskills | Columbia | 7 | 1 | 19 | 487,547 | 162,515 | 1,137,610 | 5.99 |
| | | Schoharie | 3 | 1 | 34 | 909,726 | 303,242 | 2,122,694 | 11.18 |
| | | | | 2 | 38 | 1,397,273 | 465,757 | 3,260,304 | 17.17 |
| 4 | 7: Central New York | Onondaga | 5 | 1 | 33 | 847,375 | 282,458 | 1,977,209 | 10.41 |
| | | Tompkins | 13 | 1 | 24 | 67,030 | 22,343 | 156,403 | 0.82 |
| | | | | 2 | 42 | 914,405 | 304,801 | 2,133,612 | 11.23 |
| 5 | 8: Western Finger Lakes | Livingston | 14 | 1 | 19 | 20,210 | 6,736 | 47,157 | 0.25 |
| | | Ontario | 6 | 1 | 5 | 586,740 | 195,580 | 1,369,060 | 7.21 |
| | | Steuben | 10 | 1 | 37 | 263,669 | 87,889 | 615,229 | 3.24 |
| | | | | 3 | 37 | 870,619 | 290,205 | 2,031,446 | 10.70 |
| 6 | 3: Lower Hudson Valley | Putnam | 11 | 1 | 26 | 201,207 | 67,069 | 469,483 | 2.47 |
| | | Rockland | 8 | 1 | 36 | 478,899 | 159,633 | 1,117,432 | 5.88 |
| | | | | 2 | 39 | 680,106 | 226,702 | 1,586,915 | 8.36 |
| | | | | 18 | 42 | 8,139,204 | 2,713,064 | 18,991,481 | 100% |

3.6e. Releases by County

All fourteen counties where compressor stations are located reported releases of chemicals linked to nervous system disorders.

Herkimer County ranked first with 4.3 million pounds or 22.4% of the state total, followed by Erie County (2.5 million pounds or 13.3%) and Schoharie County (2.1 million pounds or 11.2%). These three counties are responsible for nearly one-half (48.9%) of all releases.

The top five counties were responsible for 12.8 million pounds or slightly more than two-thirds (68%) of the state total.

The 14-county average was 1,356,535 pounds.

Table 3.6e.

G00–G99: Diseases of the Nervous System by County (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Rank | County | NYS DEC Region | 3 Years: 2008, 2011, 2014 | | | 7-Year Estimate: 2008-2014 | | |
|------|------------|--|---------------------------|-----------|------------------|----------------------------|-------------------|-------------|
| | | | Fac's | Ch's | Total Pounds | Average Pounds | Total Pounds | % |
| 1 | Herkimer | 6: Western Adirondacks/E. Lake Ontario | 2 | 41 | 1,821,951 | 607,317 | 4,251,219 | 22.38 |
| 2 | Erie | 9: Western New York | 2 | 34 | 1,084,410 | 361,470 | 2,530,291 | 13.32 |
| 3 | Schoharie | 4: Capital Region/Northern Catskills | 1 | 34 | 909,726 | 303,242 | 2,122,695 | 11.18 |
| 4 | Allegany | 9: Western New York | 2 | 18 | 866,625 | 288,875 | 2,022,126 | 10.65 |
| 5 | Onondaga | 7: Central New York | 1 | 33 | 847,376 | 282,459 | 1,977,210 | 10.41 |
| 6 | Ontario | 8: Western Finger Lakes | 1 | 5 | 586,740 | 195,580 | 1,369,061 | 7.21 |
| 7 | Columbia | 4: Capital Region/Northern Catskills | 1 | 19 | 487,547 | 162,516 | 1,137,610 | 5.99 |
| 8 | Rockland | 3: Lower Hudson Valley | 1 | 36 | 478,900 | 159,633 | 1,117,433 | 5.88 |
| 9 | Chautauqua | 9: Western New York | 2 | 41 | 427,437 | 142,479 | 997,354 | 5.25 |
| 10 | Steuben | 8: Western Finger Lakes | 1 | 37 | 263,670 | 87,890 | 615,230 | 3.24 |
| 11 | Putnam | 3: Lower Hudson Valley | 1 | 26 | 201,207.04 | 67,069.01 | 469,483.08 | 2.47 |
| 12 | Niagara | 9: Western New York | 1 | 19 | 76,379.14 | 25,459.71 | 178,217.98 | 0.94 |
| 13 | Tompkins | 7: Central New York | 1 | 24 | 67,030.16 | 22,343.39 | 156,403.70 | 0.82 |
| 14 | Livingston | 8: Western Finger Lakes | 1 | 19 | 20,210 | 6,737 | 47,158 | 0.25 |
| | | | 18 | 42 | 8,139,210 | 2,713,070 | 18,991,490 | 100% |

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3.7. Diseases of the Eye and Adnexa (H00-H59)

3.7a. Releases by Chemical

Forty-one of the 70 chemicals released by NYS natural gas compressor stations are associated with diseases of the eye and adnexa (ICD-10, Chapter 7). All 18 stations reported such releases. These totaled an estimated 24.7 million pounds from 2008 to 2014--an annual average of 3.5 million pounds.

Chemicals associated with eye and adnexa diseases represent 61.8% of all reported toxic releases from NYS natural gas compressor stations reported to NEI.

Nitrogen oxides were responsible for slightly less than three-fourths (73.2%) of statewide releases of chemicals linked to diseases of the eye and adnexa. Volatile organic compounds as a group ranked second (4.9 million pounds or 20%), followed by formaldehyde (1.3 million pounds or 5.3%). These three chemicals accounted for 98% of the state total.

Table 3.7a.

H00-H59. Diseases of the Eye and Adnexa by Chemical

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Chemical | | Location | | | 3 Years | 7 Year Estimate: 2008 to 2014 | | |
|----------|----------------------------|----------|------|-------|------------|-------------------------------|------------|-------|
| Rank | Name | Fac's | Cn's | Reg's | Pounds | Average | Pounds | % |
| 1 | Nitrogen Oxides | 18 | 14 | 6 | 7,749,673 | 2,583,224 | 18,082,571 | 73.17 |
| 2 | Volatile Organic Compounds | 18 | 14 | 6 | 2,108,741 | 702,914 | 4,920,396 | 19.91 |
| 3 | Formaldehyde | 18 | 14 | 6 | 561,144 | 187,048 | 1,309,336 | 5.30 |
| 4 | Sulfur Dioxide | 18 | 14 | 6 | 80,048 | 26,683 | 186,778 | 0.76 |
| 5 | Acetaldehyde | 14 | 13 | 6 | 28,272 | 9,424 | 65,969 | 0.27 |
| 6 | Acrolein | 14 | 13 | 6 | 22,596 | 7,532 | 52,723 | 0.21 |
| 7 | Benzene | 16 | 13 | 6 | 9,103 | 3,034 | 21,241 | 0.09 |
| 8 | Methanol | 8 | 7 | 6 | 8,286 | 2,762 | 19,333 | 0.08 |
| 9 | Toluene | 16 | 13 | 6 | 8,275 | 2,758 | 19,308 | 0.08 |
| 10 | Hexane | 13 | 10 | 6 | 5,222 | 1,741 | 12,184 | 0.05 |
| | | 18 | 14 | 6 | 10,581,359 | 3,527,120 | 24,689,838 | 99.90 |

3.7b. Releases by ICD Category

Diseases of the eye and adnexa system are subdivided into 12 major groups. Chemicals released by natural gas compressor stations are positively associated with 8 of them. It should be remembered, that a single chemical can be associated with more than one category of disease.

H00-H06: Nine chemicals are associated with disorders of eyelid, lacrimal system and orbit. Specific effects include: lacrimation and ptosis. These chemicals were released by all 18 stations.

H10-H13: Ten chemicals are associated with conjunctival disorders. Specific effects include: conjunctivitis and conjunctival irritation. These chemicals were released by all 18 stations.

H15-H19: Three chemicals are associated with disorders of sclera and cornea. Specific effects include: cornea damage and clouding. These chemicals were released by 13 stations.

H20-H22: A single chemical, propylene oxide, is associated with disorders of iris and ciliary body, specifically, iritis. Eight stations reported releases of this chemical.

H30-H36: Three chemicals are associated with glaucoma. Eighteen stations reported its release.

H40-H42: Two chemicals are associated with glaucoma. Fourteen stations reported its release.

H53-H54: Eleven chemicals are associated with visual disturbances and blindness. Eighteen stations reported their release.

H55-H99: Thirty-nine chemicals are associated with other disorders of eye and adnexa.

Table 3.7b

H00-H59. Diseases of the Eye and Adnexa by Chemical

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| ICD-10 | | | Facilities | | | | Chemicals | | | | Pounds | | | |
|--------|----------------|---|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------------|------------------|------------------|-------------------|
| # | Description | | '08 | '11 | '14 | Tot | '08 | '11 | '14 | Tot | 2008 | 2011 | 2014 | Total |
| 1 | H00-H06 | Disorders of eyelid, lacrimal system and orbit | 18 | 17 | 16 | 18 | 9 | 9 | 9 | 9 | 112,005 | 235,242 | 224,320 | 571,568 |
| 2 | H10-H13 | Disorders of conjunctiva | 18 | 18 | 17 | 18 | 10 | 10 | 10 | 10 | 487,727 | 1,070,740 | 1,130,225 | 2,688,693 |
| 3 | H15-H19 | Disorders of sclera and cornea | 12 | 12 | 11 | 13 | 3 | 3 | 3 | 3 | 309 | 387 | 311 | 1,008 |
| 4 | H20-H22 | Disorders of iris & ciliary body | 8 | 5 | 4 | 8 | 1 | 1 | 1 | 1 | 6 | 114 | 141 | 263 |
| 5 | H25-H28 | Disorders of lens | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | H30-H36 | Disorders of choroid & retina | 18 | 17 | 16 | 18 | 3 | 3 | 3 | 3 | 111,765 | 234,361 | 223,601 | 569,727 |
| 7 | H40-H42 | Glaucoma | 14 | 10 | 10 | 14 | 2 | 2 | 2 | 2 | 40 | 117 | 124 | 282 |
| 8 | H43-H45 | Disorders of vitreous body and globe | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9 | H46-H48 | Disorders of optic nerve and visual pathways | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10 | H49-H52 | Disorders of ocular muscles, binocular movement, accommodation & refraction | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11 | H53-H54 | Visual disturbances & blindness | 18 | 18 | 16 | 18 | 11 | 11 | 11 | 11 | 115,165 | 240,009 | 228,723 | 583,898 |
| 12 | H55-H59 | Other disorders of eye and adnexa | 18 | 18 | 17 | 18 | 39 | 39 | 39 | 39 | 2,777,490 | 4,113,923 | 3,700,237 | 10,591,651 |
| | H00-H59 | Total | 18 | 18 | 17 | 18 | 41 | 41 | 41 | 41 | 2,777,500 | 4,113,949 | 3,700,250 | 10,591,700 |

3.7c. Releases by Facility

All 18 natural gas compressor stations in NYS reported releasing chemicals associated with diseases of the eye and adnexa.

The top 5 polluters were facilities operated by the Tennessee Gas Pipeline Company.

TGPC's Compressor Station 245 in Winfield ranked first with 7 million pounds (28.3%), followed by Compressor Station 229 in Eden (3.7 million pounds or 15%) and Compressor 249 in Carlisle (2.6 million pounds or 10.4%). These three sites were responsible for more than one-half (53.7%) of all statewide releases.

The top 5 facilities were responsible for slightly less than two-thirds (65.4%) of the total.

The facility average was 1,379,496 pounds.

Table 3.7c.

H00-H59: Diseases of the Eye and Adnexa by Facility

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Facility | | Location | | Chemicals | | | 7 Years (estimate) | | |
|----------|-----------------------|--------------------|------------|-----------|-----------|-----------|--------------------|-------------------|-------------|
| Rank | Facility Name (Short) | Town | County | '08 | '11 | '14 | Average | Tot. Lbs. | % |
| 1 | TGPC CS 245 | Winfield | Herkimer | 32 | 32 | 20 | 1,001,990 | 7,013,931 | 28.25 |
| 2 | TGPC 229 & TEG DF | Eden | Erie | 30 | 29 | 30 | 532,203 | 3,725,419 | 15.00 |
| 3 | TGPC CS 249 | Carlisle | Schoharie | 32 | 21 | 21 | 368,835 | 2,581,844 | 10.40 |
| 4 | TGPC CS 241 | LaFayette | Onondaga | 31 | 23 | 31 | 222,022 | 1,554,152 | 6.26 |
| 5 | TGPC CS 254 | Chatham | Columbia | 19 | 12 | 5 | 194,478 | 1,361,349 | 5.48 |
| 6 | AGT Stony Point CS | Stony Point | Rockland | 33 | 18 | 18 | 192,160 | 1,345,120 | 5.42 |
| 7 | AGT SOUTHEAST CS | Southeast | Putnam | 19 | 14 | 25 | 183,354 | 1,283,480 | 5.17 |
| 8 | TGPC CS 237 | Manchester, Phelps | Ontario | 5 | 4 | 4 | 177,838 | 1,244,864 | 5.01 |
| 9 | NFGSC Concord CS | Concord | Erie | 7 | 6 | 8 | 128,461 | 899,225 | 3.62 |
| 10 | NFGSC Independ. CS | Andover | Allegany | 11 | 6 | 13 | 95,203 | 666,418 | 2.68 |
| 11 | DTI Borger CS | Ithaca | Tompkins | 25 | 25 | 15 | 90,898 | 636,288 | 2.56 |
| 12 | TGPC CS 224 | Clymer | Chautauqua | 32 | 30 | 32 | 84,987 | 594,909 | 2.40 |
| 13 | NFGSC Beech Hill CS | Willing | Allegany | 16 | 16 | 17 | 73,519 | 514,636 | 2.07 |
| 14 | DTI Woodhull Station | Woodhull | Steuben | 25 | 32 | 36 | 59,457 | 416,201 | 1.68 |
| 15 | NFGSC Nashville CS | Hanover | Chautauqua | 19 | 19 | 0 | 50,123 | 350,859 | 1.41 |
| 16 | TGPC CS 230-C | Lockport | Niagara | 19 | 18 | 19 | 42,774 | 299,420 | 1.21 |
| 17 | DTI Utica Station | Frankfort | Herkimer | 19 | 23 | 35 | 25,770 | 180,387 | 0.73 |
| 18 | TGPC CS 233 | York | Livingston | 19 | 12 | 3 | 23,203 | 162,421 | 0.65 |
| | | | | 41 | 41 | 41 | 3,547,275 | 24,830,922 | 100% |

3.7d. Releases by DEC Region

The 18 compressor stations analyzed are in 6 of New York's 9 DEC regions. All 6 regions had releases of chemicals associated with mental and diseases of the eye and adnexa.

DEC Region 6, Western Adirondacks/Eastern Lake Ontario, ranked first with 7.2 million pounds or 20.3% of total releases from 2008 to 2014. Region 9, Western New York, was a close second with 6.9 million pounds (28.2%), followed by Region 4, Capital Region/Northern Catskills, 3.9 million pounds (16.1%).

Table 3.7d.

Diseases of the Eye and Adnexa by DEC Region

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| NYS DEC Region | | County | | 3 Years: 2008, 2011, 2014 | | | 7-Year Estimate: 2008-2014 | | |
|----------------|--------------------------------------|------------|------|---------------------------|------|--------------|----------------------------|--------------|-------|
| Rank | No. \ Name | Name | Rank | Fac's | Ch's | Total Pounds | Average Pounds | Total Pounds | % |
| 1 | 6: W. Adirondacks/E Lake Ontario | Herkimer | 1 | 2 | 40 | 3,083,279 | 1,027,760 | 7,194,317 | 29.30 |
| 2 | 9: Western New York | Allegany | 9 | 2 | 18 | 506,166 | 168,722 | 1,181,054 | 4.81 |
| | | Chautauqua | 10 | 2 | 40 | 355,206 | 118,402 | 828,815 | 3.38 |
| | | Erie | 2 | 2 | 33 | 1,981,990 | 660,663 | 4,624,644 | 18.84 |
| | | Niagara | 13 | 1 | 19 | 128,323 | 42,774 | 299,420 | 1.22 |
| | | | | 7 | 41 | 2,971,686 | 990,562 | 6,933,933 | 28.24 |
| 3 | 4: Capital Region/Northern Catskills | Columbia | 5 | 1 | 19 | 583,435 | 194,478 | 1,361,349 | 5.54 |
| | | Schoharie | 3 | 1 | 32 | 1,106,504 | 368,835 | 2,581,844 | 10.52 |
| | | | | 2 | 36 | 1,689,940 | 563,313 | 3,943,192 | 16.06 |
| 4 | 3: Lower Hudson Valley | Putnam | 7 | 1 | 27 | 550,063 | 183,354 | 1,283,480 | 5.23 |
| | | Rockland | 6 | 1 | 34 | 576,480 | 192,160 | 1,345,120 | 5.48 |
| | | | | 2 | 38 | 1,126,543 | 375,514 | 2,628,600 | 10.71 |
| 5 | 7: Central New York | Onondaga | 4 | 1 | 31 | 666,065 | 222,022 | 1,554,152 | 6.33 |
| | | Tompkins | 11 | 1 | 25 | 272,695 | 90,898 | 636,288 | 2.59 |
| | | | | 2 | 41 | 938,760 | 312,920 | 2,190,439 | 8.92 |
| 6 | 8: Western Finger Lakes | Livingston | 14 | 1 | 19 | 69,609 | 23,203 | 162,421 | 0.66 |
| | | Ontario | 8 | 1 | 5 | 533,513 | 177,838 | 1,244,864 | 5.07 |
| | | Steuben | 12 | 1 | 37 | 178,372 | 59,457 | 416,201 | 1.70 |
| | | | | 2 | 37 | 711,885 | 237,295 | 1,661,065 | 6.77 |
| | | | | 18 | 41 | 10,522,092 | 3,507,364 | 24,551,547 | 100% |

3.7e. Releases by County

All fourteen counties where compressor stations are located reported releases of chemicals linked to diseases of the eye and adnexa.

Herkimer County ranked first with 7.2 million pounds or 29.1% of the state total, followed by Erie County (4.6 million pounds or 18.7%) and Schoharie County (2.6 million pounds or 10.5%). These three counties are responsible for more than one-half (58.3%) of all releases.

The top five counties were responsible for 17.3 million pounds or slightly more than two-thirds (70%) of the state total.

The 14-county average was 1,765,283 pounds.

Table 3.7e.

Diseases of the Eye and Adnexa by County

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Rank | County | NYS DEC Region | 3 Years: 2008, 2011, 2014 | | | 7-Year Estimate: 2008-2014 | | |
|------|------------|--|---------------------------|------|--------------|----------------------------|--------------|-------|
| | | | Fac's | Ch's | Total Pounds | Average Pounds | Total Pounds | % |
| 1 | Herkimer | 6: Western Adirondacks/E. Lake Ontario | 2 | 40 | 3,083,279 | 1,027,760 | 7,194,317 | 29.11 |
| 2 | Erie | 9: Western New York | 2 | 33 | 1,981,990 | 660,663 | 4,624,644 | 18.71 |
| 3 | Schoharie | 4: Capital Region/Northern Catskills | 1 | 32 | 1,106,504 | 368,835 | 2,581,844 | 10.45 |
| 4 | Onondaga | 7: Central New York | 1 | 31 | 666,065 | 222,022 | 1,554,152 | 6.29 |
| 5 | Columbia | 4: Capital Region/Northern Catskills | 1 | 19 | 583,435 | 194,478 | 1,361,349 | 5.51 |
| 6 | Rockland | 3: Lower Hudson Valley | 1 | 34 | 576,480 | 192,160 | 1,345,120 | 5.44 |
| 7 | Putnam | 3: Lower Hudson Valley | 1 | 27 | 550,063 | 183,354 | 1,283,480 | 5.19 |
| 8 | Ontario | 8: Western Finger Lakes | 1 | 5 | 533,513 | 177,838 | 1,244,864 | 5.04 |
| 9 | Allegany | 9: Western New York | 2 | 18 | 506,166 | 168,722 | 1,181,054 | 4.78 |
| 10 | Chautauqua | 9: Western New York | 2 | 40 | 355,206 | 118,402 | 828,815 | 3.35 |
| 11 | Tompkins | 7: Central New York | 1 | 25 | 272,695 | 90,898 | 636,288 | 2.57 |
| 12 | Steuben | 8: Western Finger Lakes | 1 | 37 | 178,372 | 59,457 | 416,201 | 1.68 |
| 13 | Niagara | 9: Western New York | 1 | 19 | 128,323 | 42,774 | 299,420 | 1.21 |
| 14 | Livingston | 8: Western Finger Lakes | 1 | 19 | 69,609 | 23,203 | 162,421 | 0.66 |
| | | | 18 | 41 | 10,591,701 | 3,530,567 | 24,713,969 | 100% |

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3.8. Diseases of the Ear and Mastoid Process (H60-H95)

3.8a. Releases by Chemical

Fifteen of the 70 chemicals released by NYS natural gas compressor stations are associated with diseases of the ear and mastoid process (ICD-10, Chapter 8). All 18 stations reported such releases. These totaled an estimated 17.3 million pounds from 2008 to 2014--an annual average of 2.5 million pounds.

Chemicals associated with diseases of the ear and mastoid process represented 43.5% of all reported releases by natural gas compressor stations.

Two chemicals, carbon monoxide and volatile organic compounds, were responsible for 99.8% of all statewide releases.

Table 3.8a.

Diseases of the Ear and Mastoid Process by Chemical (Top 10 Chemicals by Pounds Released)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Chemical | | Location | | | 3 Years | 7 Year Estimate: 2008 to 2014 | | |
|----------|----------------------------|----------|------|-------|-----------|-------------------------------|------------|-------|
| Rank | Name | Fac's | Cn's | Reg's | Pounds | Average | Pounds | % |
| 1 | Carbon Monoxide | 18 | 14 | 6 | 5,297,028 | 1,765,676 | 12,359,731 | 71.26 |
| 2 | Volatile Organic Compounds | 18 | 14 | 6 | 2,108,741 | 702,914 | 4,920,396 | 28.37 |
| 3 | Benzene | 16 | 13 | 6 | 9,103 | 3,034 | 21,241 | 0.12 |
| 4 | Toluene | 16 | 13 | 6 | 8,275 | 2,758 | 19,308 | 0.11 |
| 5 | Hexane | 13 | 10 | 6 | 5,222 | 1,741 | 12,184 | 0.07 |
| 6 | Xylenes (Mixed Isomers) | 15 | 13 | 6 | 3,598 | 1,199 | 8,394 | 0.05 |
| 7 | Ethyl Benzene | 15 | 13 | 6 | 1,198 | 399 | 2,794 | 0.02 |
| 8 | Methylene Chloride | 8 | 7 | 6 | 269 | 90 | 629 | 0.00 |
| 9 | Manganese | 9 | 9 | 6 | 150 | 50 | 350 | 0.00 |
| 10 | Styrene | 8 | 7 | 6 | 100 | 33 | 234 | 0.00 |
| 11 | Vinyl Chloride | 8 | 7 | 6 | 46 | 15 | 107 | 0.00 |
| 12 | Mercury | 16 | 13 | 6 | 30 | 10 | 70 | 0.00 |
| 13 | Cadmium | 9 | 9 | 6 | 13 | 4 | 30 | 0.00 |
| 14 | Lead | 16 | 12 | 6 | 0 | 0 | 1 | 0.00 |
| 15 | Cobalt | 6 | 6 | 5 | 0 | 0 | 0 | 0.00 |
| | | 18 | 14 | 6 | 7,433,772 | 2,477,924 | 17,345,468 | 100% |

3.8b. Releases by ICD Category

Diseases of the ear and mastoid process are subdivided into 4 major groups. Chemicals released by natural gas compressor stations are positively associated with two of them. It should be remembered, that a single chemical can be associated with more than one category of disease.

H80-H83: Fifteen chemicals are associated with diseases of inner ear, including, change in cochlear structure or function, hearing deficits and hearing disturbance. These chemicals were released by all 18 stations.

H90-H95: These fifteen all had effects broadly characterized as other disorders of ear, characterized as changes in hearing acuity, hearing loss, and ototoxicity.

Table 3.8b.

Diseases of the Ear and Mastoid Process by ICD Code Group

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| ICD-10 | | | Facilities | | | | Chemicals | | | | Pounds | | | |
|--------|-------------|------------------------------------|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------------|------------------|------------------|------------------|
| # | Description | | '08 | '11 | '14 | Tot | '08 | '11 | '14 | Tot | 2008 | 2011 | 2014 | Total |
| 1 | H60-H62 | Diseases of external ear | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 | H65-H75 | Diseases of middle ear and mastoid | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 | H80-H83 | Diseases of inner ear | 16 | 15 | 13 | 16 | 5 | 5 | 5 | 5 | 1,810 | 5,743 | 5,661 | 13,215 |
| 4 | H90-H95 | Other disorders of ear | 18 | 18 | 17 | 18 | 15 | 15 | 15 | 15 | 1,796,211 | 2,874,068 | 2,763,491 | 7,433,772 |
| | H60-H95 | Total | 18 | 18 | 17 | 18 | 15 | 15 | 15 | 15 | 1,796,211 | 2,874,068 | 2,763,491 | 7,433,772 |

3.8c. Releases by Facility

All 18 natural gas compressor stations in NYS reported releasing chemicals associated with diseases of the ear and mastoid process.

The top 6 polluters were facilities operated by the Tennessee Gas Pipeline Company.

TGPC's Compressor Station 245 in Winfield ranked first with 3.8 million pounds (22%), followed by Compressor Station 249 in Carlisle (1.9 million pounds or 11.1%) and Compressor 241 in Lafayette (1.8 million pounds or 10.1%). These three sites were responsible for 43.1% of all statewide releases.

The top 5 facilities were responsible for more than one-half (58.4%) of the total.

The facility average was 970,115 pounds.

Table 3.8c.

Diseases of the Ear and Mastoid Process by Facility (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Facility | | Location | | Chemicals | | | 7 Years (estimate) | | |
|----------|-----------------------|--------------------|------------|-----------|-----|-----|--------------------|------------|-------|
| Rank | Facility Name (Short) | Town | County | '08 | '11 | '14 | Average | Tot. Lbs. | % |
| 1 | TGPC CS 245 | Winfield | Herkimer | 12 | 12 | 9 | 548,196 | 3,837,375 | 21.98 |
| 2 | TGPC CS 249 | Carlisle | Schoharie | 12 | 9 | 9 | 276,272 | 1,933,902 | 11.07 |
| 3 | TGPC CS 241 | LaFayette | Onondaga | 11 | 10 | 11 | 251,763 | 1,762,343 | 10.09 |
| 4 | TGPC 229 & TEG DF | Eden | Erie | 11 | 10 | 11 | 201,990 | 1,413,927 | 8.10 |
| 5 | TGPC CS 237 | Manchester, Phelps | Ontario | 3 | 2 | 2 | 178,687 | 1,250,808 | 7.16 |
| 6 | TGPC CS 254 | Chatham | Columbia | 10 | 6 | 2 | 157,064 | 1,099,446 | 6.30 |
| 7 | AGT Stony Point CS | Stony Point | Rockland | 14 | 8 | 9 | 144,424 | 1,010,968 | 5.79 |
| 8 | NFGSC Independence CS | Andover | Allegany | 7 | 3 | 9 | 138,539 | 969,770 | 5.55 |
| 9 | NFGSC Beech Hill CS | Willing | Allegany | 8 | 8 | 9 | 133,537 | 934,759 | 5.35 |
| 10 | NFGSC Concord CS | Concord | Erie | 4 | 4 | 4 | 115,615 | 809,305 | 4.63 |
| 11 | TGPC CS 224 | Clymer | Chautauqua | 12 | 10 | 12 | 93,625 | 655,373 | 3.75 |
| 12 | DTI Woodhull Station | Woodhull | Steuben | 12 | 14 | 15 | 77,004 | 539,026 | 3.09 |
| 13 | AGT SOUTHEAST CS | Southeast | Putnam | 10 | 7 | 12 | 57,674 | 403,718 | 2.31 |
| 14 | NFGSC Nashville CS | Hanover | Chautauqua | 10 | 10 | 0 | 49,975 | 349,825 | 2.00 |
| 15 | TGPC CS 230-C | Lockport | Niagara | 10 | 9 | 10 | 22,205 | 155,432 | 0.89 |
| 16 | DTI Borger CS | Ithaca | Tompkins | 12 | 12 | 8 | 21,502 | 150,516 | 0.86 |
| 17 | DTI Utica Station | Frankfort | Herkimer | 10 | 11 | 15 | 20,007 | 140,050 | 0.80 |
| 18 | TGPC CS 233 | York | Livingston | 10 | 6 | 2 | 6,505 | 45,534 | 0.26 |
| | | | | 15 | 15 | 15 | 2,494,582 | 17,462,077 | 100% |

3.8d. Releases by DEC Region

The 18 compressor stations analyzed are in 6 of New York's 9 DEC regions. All 6 regions had releases of chemicals associated with mental and diseases of the eye and adnexa.

Region 9, Western New York, ranked first with 5.2 million pounds or 29.9% of total releases from 2008 to 2014. DEC Region 6, Western Adirondacks/Eastern Lake Ontario, was second with 4 million pounds (23%), followed by Region 4, Capital Region/Northern Catskills, 3 million pounds (17.5%).

Table 3.8d.

Diseases of the Ear and Mastoid Process by DEC Region (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| NYS DEC Region | | County | | 3 Years: 2008, 2011, 2014 | | | 7-Year Estimate: 2008-2014 | | |
|----------------|-----------------------------------|------------|------|---------------------------|------|--------------|----------------------------|--------------|-------|
| Rank | NYS DEC Region | Name | Rank | Fac's | Ch's | Total Pounds | Average Pounds | Total Pounds | % |
| 1 | 9: Western New York | Allegany | 4 | 2 | 9 | 816,226 | 272,075 | 1,904,528 | 10.98 |
| | | Chautauqua | 9 | 2 | 15 | 380,824 | 126,941 | 888,589 | 5.12 |
| | | Erie | 2 | 2 | 12 | 952,814 | 317,605 | 2,223,232 | 12.82 |
| | | Niagara | 12 | 1 | 10 | 66,614 | 22,205 | 155,432 | 0.90 |
| | | | | 7 | 15 | 2,216,478 | 738,826 | 5,171,782 | 29.82 |
| 2 | 6: W. Adirondacks/E. Lake Ontario | Herkimer | 1 | 2 | 15 | 1,704,611 | 568,204 | 3,977,425 | 22.93 |
| 3 | 4: Capital Region/N. Catskills | Columbia | 7 | 1 | 10 | 471,191 | 157,064 | 1,099,446 | 6.34 |
| | | Schoharie | 3 | 1 | 12 | 828,815 | 276,272 | 1,933,902 | 11.15 |
| | | | | 2 | 14 | 1,300,006 | 433,335 | 3,033,348 | 17.49 |
| 4 | 7: Central New York | Onondaga | 5 | 1 | 11 | 755,290 | 251,763 | 1,762,343 | 10.16 |
| | | Tompkins | 13 | 1 | 12 | 64,507 | 21,502 | 150,516 | 0.87 |
| | | | | 2 | 15 | 819,797 | 273,266 | 1,912,860 | 11.03 |
| 5 | 8: Western Finger Lakes | Livingston | 14 | 1 | 10 | 19,515 | 6,505 | 45,534 | 0.26 |
| | | Ontario | 6 | 1 | 3 | 536,060 | 178,687 | 1,250,808 | 7.21 |
| | | Steuben | 10 | 1 | 15 | 231,011 | 77,004 | 539,026 | 3.11 |
| | | | | 3 | 15 | 786,586 | 262,195 | 1,835,368 | 10.58 |
| 6 | 3: Lower Hudson Valley | Putnam | 11 | 1 | 12 | 173,022 | 57,674 | 403,718 | 2.33 |
| | | Rockland | 8 | 1 | 14 | 433,272 | 144,424 | 1,010,968 | 5.83 |
| | | | | 2 | 15 | 606,294 | 202,098 | 1,414,686 | 8.16 |
| | | | | 18 | 15 | 7,433,772 | 2,477,924 | 17,345,468 | 100% |

3.8e. Releases by County

All fourteen counties where compressor stations are located reported releases of chemicals linked to diseases of the ear and mastoid process.

Herkimer County ranked first with 4 million pounds or 23% of the state total, followed by Erie County (2.2 million pounds or 12.8%) and Schoharie County (2 million pounds or 11.2%). These three counties are responsible for slightly less than one-half (47%) of all releases.

The top five counties were responsible for 11.8 million pounds or slightly more than two-thirds (68%) of the state total.

The 14-county average was 1,238,962 pounds.

Table 3.8e.

Diseases of the Ear and Mastoid Process by County (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Rank | County | NYS DEC Region | 3 Years: 2008, 2011, 2014 | | | 7-Year Estimate: 2008-2014 | | |
|------|------------|--|---------------------------|-----------|------------------|----------------------------|-------------------|-------------|
| | | | Fac's | Ch's | Total Pounds | Average Pounds | Total Pounds | % |
| 1 | Herkimer | 6: Western Adirondacks/E. Lake Ontario | 2 | 15 | 1,704,611 | 568,204 | 3,977,424 | 22.93 |
| 2 | Erie | 9: Western New York | 2 | 12 | 952,814 | 317,605 | 2,223,231 | 12.82 |
| 3 | Schoharie | 4: Capital Region/Northern Catskills | 1 | 12 | 828,815 | 276,272 | 1,933,901 | 11.15 |
| 4 | Allegany | 9: Western New York | 2 | 9 | 816,226 | 272,075 | 1,904,528 | 10.98 |
| 5 | Onondaga | 7: Central New York | 1 | 11 | 755,290 | 251,763 | 1,762,343 | 10.16 |
| 6 | Ontario | 8: Western Finger Lakes | 1 | 3 | 536,060 | 178,687 | 1,250,807 | 7.21 |
| 7 | Columbia | 4: Capital Region/Northern Catskills | 1 | 10 | 471,191 | 157,064 | 1,099,446 | 6.34 |
| 8 | Rockland | 3: Lower Hudson Valley | 1 | 14 | 433,272 | 144,424 | 1,010,967 | 5.83 |
| 9 | Chautauqua | 9: Western New York | 2 | 15 | 380,824 | 126,941 | 888,589 | 5.12 |
| 10 | Steuben | 8: Western Finger Lakes | 1 | 15 | 231,011 | 77,004 | 539,026 | 3.11 |
| 11 | Putnam | 3: Lower Hudson Valley | 1 | 12 | 173,022 | 57,674 | 403,718 | 2.33 |
| 12 | Niagara | 9: Western New York | 1 | 10 | 66,614 | 22,205 | 155,432 | 0.90 |
| 13 | Tompkins | 7: Central New York | 1 | 12 | 64,507 | 21,502 | 150,516 | 0.87 |
| 14 | Livingston | 8: Western Finger Lakes | 1 | 10 | 19,515 | 6,505 | 45,534 | 0.26 |
| | | | 18 | 15 | 7,433,772 | 2,477,924 | 17,345,462 | 100% |

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3.9. Diseases of the Circulatory System (I00-I99)

3.9a. Releases by Chemical

Thirty-one of the 70 chemicals released by NYS natural gas compressor stations are associated with diseases of the circulatory system (ICD-10 Chapter 9). All 18 stations reported such releases. These totaled an estimated 16.2 million pounds from 2008 to 2014--an annual average of 2.3 million pounds.

Eighteen of these 31 chemicals are categorized as known human circulatory system toxicants by U.S. ATSDR.

Carbon monoxide ranked first accounting for slightly more than three-fourths (76.5%) of the state total or 12.4 million pounds. Formaldehyde ranked second (1,309,335 pounds or 8.1%), closely followed by PM10 (1,259,744 pounds or 7.8%).

The average annual release was 5.6 million pounds.

Chemicals associated with circulatory system diseases represented 40.4% of releases by the state's natural gas compressor stations.

Table 3.9a.

Diseases of the Circulatory System by Chemical (Top 10 Chemicals by Pounds Released)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Chemical | | Location | | | 3 Years | 7 Year Estimate: 2008 to 2014 | | |
|----------|-----------------------------|----------|------|-------|-----------|-------------------------------|------------|-------|
| Rank | Name | Fac's | Cn's | Reg's | Pounds | Average | Pounds | % |
| 1 | Carbon Monoxide | 18 | 14 | 6 | 5,297,028 | 1,765,676 | 12,359,731 | 76.53 |
| 2 | Formaldehyde | 18 | 14 | 6 | 561,144 | 187,048 | 1,309,336 | 8.11 |
| 3 | PM10 Primary (Filt + Cond) | 18 | 14 | 6 | 539,890 | 179,963 | 1,259,744 | 7.80 |
| 4 | PM2.5 Primary (Filt + Cond) | 18 | 14 | 6 | 474,085 | 158,028 | 1,106,198 | 6.85 |
| 5 | Acrolein | 14 | 13 | 6 | 22,596 | 7,532 | 52,723 | 0.33 |
| 6 | Methanol | 8 | 7 | 6 | 8,286 | 2,762 | 19,333 | 0.12 |
| 7 | Toluene | 16 | 13 | 6 | 8,275 | 2,758 | 19,308 | 0.12 |
| 8 | Hexane | 13 | 10 | 6 | 5,222 | 1,741 | 12,184 | 0.08 |
| 9 | 1,3-Butadiene | 14 | 13 | 6 | 2,022 | 674 | 4,719 | 0.03 |
| 10 | Ammonia | 8 | 7 | 5 | 674 | 225 | 1,573 | 0.01 |
| | | 18 | 14 | 6 | 6,919,221 | 2,306,407 | 16,144,849 | 99.97 |

3.9b. Releases by ICD Category

Circulatory system diseases are subdivided into 10 major groups. Chemicals released by natural gas compressor stations in NYS are positively associated with four of them. It should be remembered, that a single chemical can be associated with more than one category of disease.

I10-I15: One chemical released by 14 of the 18 compressor stations reporting to NEI has been associated with hypertensive disease.

I10-I15: One chemical released by 16 of the 18 compressor stations reporting to NEI has been associated with chronic rheumatic heart diseases.

I30-I52: Sixteen chemicals are associated with other forms of heart disease. Specific diseases cite in the literature include: cardiac arrhythmia, heart weight change, increased cardiovascular mortality, and acute pulmonary edema. These chemicals were in the emission inventories of all 18 NYS compressor stations reporting to NEI and totaled 1.6 million pounds.

I70-I79: Six chemicals are associated with diseases of arteries, arterioles and capillaries: blood vessels changes and regional, general arteriolar or venous dilation. All 18 stations reported release of these chemicals. Aggregate releases totaled 569,641 pounds.

I95-I99: Twenty-two chemicals are associated with other and unspecified disorders of the circulatory system. These totaled 5.3 million pounds.

Table 3.9b.

Diseases of the Circulatory System by ICD Code Group

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| ICD-10 | | Facilities | | | | Chemicals | | | | Pounds | | | |
|----------------------|--|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------------|------------------|------------------|------------------|
| # | Description | '08 | '11 | '14 | Tot | '08 | '11 | '14 | Tot | 2008 | 2011 | 2014 | Total |
| 1 | I00-I02 Acute rheumatic fever | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 | I05-I09 Chronic rheumatic heart diseases | 13 | 12 | 12 | 14 | 1 | 1 | 1 | 1 | 273 | 998 | 750 | 2,022 |
| 3 | I10-I15 Hypertensive diseases | 16 | 8 | 11 | 16 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| 4 | I20-I25 Ischemic heart diseases | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | I26-I28 Pulmonary heart disease and diseases of pulmonary circulation | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | I30-I52 Other forms of heart disease | 18 | 18 | 16 | 18 | 16 | 16 | 16 | 16 | 312,721 | 697,573 | 575,238 | 1,585,533 |
| 7 | I60-I69 Cerebrovascular diseases | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8 | I70-I79 Diseases of arteries, arterioles and capillaries | 18 | 17 | 16 | 18 | 6 | 6 | 6 | 6 | 111,642 | 233,625 | 224,373 | 569,641 |
| 9 | I80-I89 Diseases of veins, lymphatic vessels and lymph nodes, not elsewhere classified | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10 | I95-I99 Other and unspecified disorders of the circulatory system | 18 | 18 | 17 | 18 | 22 | 22 | 22 | 22 | 1,424,545 | 2,053,712 | 1,866,817 | 5,345,075 |
| I00-I99 Total | | 18 | 18 | 17 | 18 | 31 | 31 | 31 | 31 | 1,735,766 | 2,747,361 | 2,438,330 | 6,921,459 |

3.9c. Releases by Facility

All 18 natural gas compressor stations in NYS reported releases chemicals associated with circulatory system disease.

The top 6 polluters were facilities operated by the Tennessee Gas Pipeline Company.

Tennessee Gas Pipeline Company Compressor Station 245, ranked first with 3.6 million pounds or 22% of the state total, followed by Compressor Station 249 in Carlisle (1.8 million pounds or 11.1%) and Compressor Station 241 in LaFayette (1.6 million pounds or 9.9%). These three facilities were responsible for 43% of the state total.

The top 5 facilities were responsible for 59% of all releases.

The facility average was 902,768 pounds.

Table 3.9c.

Diseases of the Circulatory System by Facility (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Facility | | Location | | Chemicals | | | 7 Years (estimate) | | |
|----------|-----------------------|--------------------|------------|-----------|-----------|-----------|--------------------|-------------------|-------------|
| Rank | Facility Name (Short) | Town | County | '08 | '11 | '14 | Average | Tot. Lbs. | % |
| 1 | TGPC CS 245 | Winfield | Herkimer | 23 | 23 | 15 | 514,643 | 3,602,504 | 22.17 |
| 2 | TGPC CS 249 | Carlisle | Schoharie | 23 | 16 | 16 | 258,460 | 1,809,220 | 11.13 |
| 3 | TGPC CS 241 | LaFayette | Onondaga | 22 | 17 | 22 | 229,876 | 1,609,133 | 9.90 |
| 4 | TGPC 229 & TEG DF | Eden | Erie | 20 | 19 | 20 | 211,102 | 1,477,716 | 9.09 |
| 5 | TGPC CS 237 | Manchester, Phelps | Ontario | 5 | 4 | 2 | 161,984 | 1,133,891 | 6.98 |
| 6 | TGPC CS 254 | Chatham | Columbia | 15 | 8 | 5 | 147,900 | 1,035,300 | 6.37 |
| 7 | NFGSC Concord CS | Concord | Erie | 7 | 6 | 8 | 133,132 | 931,923 | 5.73 |
| 8 | NFGSC Beech Hill CS | Willing | Allegany | 12 | 12 | 13 | 129,878 | 909,148 | 5.59 |
| 9 | NFGSC Independence CS | Andover | Allegany | 9 | 6 | 10 | 106,814 | 747,699 | 4.60 |
| 10 | AGT Stony Point CS | Stony Point | Rockland | 26 | 13 | 14 | 102,540 | 717,779 | 4.42 |
| 11 | TGPC CS 224 | Clymer | Chautauqua | 23 | 21 | 23 | 88,805 | 621,634 | 3.83 |
| 12 | DTI Woodhull Station | Woodhull | Steuben | 19 | 25 | 26 | 67,558 | 472,907 | 2.91 |
| 13 | AGT SOUTHEAST CS | Southeast | Putnam | 15 | 10 | 18 | 55,141 | 385,987 | 2.38 |
| 14 | NFGSC Nashville CS | Hanover | Chautauqua | 16 | 16 | 0 | 42,750 | 299,248 | 1.84 |
| 15 | TGPC CS 230-C | Lockport | Niagara | 15 | 14 | 15 | 25,902 | 181,314 | 1.12 |
| 16 | DTI Borger CS | Ithaca | Tompkins | 19 | 19 | 11 | 20,045 | 140,315 | 0.86 |
| 17 | DTI Utica Station | Frankfort | Herkimer | 16 | 18 | 26 | 16,299 | 114,095 | 0.70 |
| 18 | TGPC CS 233 | York | Livingston | 15 | 8 | 1 | 8,572 | 60,007 | 0.37 |
| | | | | 31 | 31 | 31 | 2,321,403 | 16,249,821 | 100% |

3.9d. Releases by DEC Region

The 18 compressor stations analyzed are in 6 of New York's 9 DEC regions. All 6 regions had releases of chemicals associated with circulatory diseases.

DEC Region 9, Western New York, ranked first with an estimated 5.1 million pounds of toxic releases from 2008 to 2014. This represented nearly one-third (31.4%) of the state total. Region 6, Western Adirondacks/Eastern Lake Ontario, ranked second (3.7 million pounds or 23%), followed by Region 4, Capital Region/Northern Catskills (2.8 million pounds or 17.6%).

Table 3.9d.

Diseases of the Circulatory System by DEC Region (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| NYS DEC Region | | County | | 3 Years: 2008, 2011, 2014 | | | 7-Year Estimate: 2008-2014 | | |
|----------------|-----------------------------------|------------|------|---------------------------|------|--------------|----------------------------|--------------|-------|
| Rank | Number \ Name | Name | Rank | Fac's | Ch's | Total Pounds | Average Pounds | Total Pounds | % |
| 1 | 9: Western New York | Allegany | 4 | 2 | 14 | 710,077 | 236,692 | 1,656,847 | 10.26 |
| | | Chautauqua | 8 | 2 | 30 | 351,913 | 117,304 | 821,132 | 5.08 |
| | | Erie | 2 | 2 | 23 | 1,032,702 | 344,234 | 2,409,639 | 14.92 |
| | | Niagara | 12 | 1 | 15 | 77,705 | 25,901 | 181,313 | 1.12 |
| | | | | 7 | 31 | 2,172,397 | 724,131 | 5,068,931 | 31.39 |
| | | | | | | | | | |
| 2 | 6: W. Adirondacks/E. Lake Ontario | Herkimer | 1 | 2 | 30 | 1,592,828 | 530,942 | 3,716,599 | 23.01 |
| | | | | | | | | | |
| 3 | 4: Capital Region/N. Catskills | Columbia | 7 | 1 | 15 | 443,699 | 147,899 | 1,035,299 | 6.41 |
| | | Schoharie | 3 | 1 | 23 | 775,379 | 258,459 | 1,809,219 | 11.20 |
| | | | | 2 | 27 | 1,219,078 | 406,358 | 2,844,518 | 17.61 |
| | | | | | | | | | |
| 4 | 7: Central New York | Onondaga | 5 | 1 | 22 | 689,628 | 229,876 | 1,609,132 | 9.96 |
| | | Tompkins | 13 | 1 | 19 | 60,135 | 20,045 | 140,315 | 0.87 |
| | | | | 2 | 31 | 749,763 | 249,921 | 1,749,447 | 10.83 |
| | | | | | | | | | |
| 5 | 8: Western Finger Lakes | Livingston | 14 | 1 | 15 | 25,717 | 8,572 | 60,006 | 0.37 |
| | | Ontario | 6 | 1 | 5 | 485,953 | 161,984 | 1,133,891 | 7.02 |
| | | Steuben | 10 | 1 | 27 | 202,674 | 67,558 | 472,907 | 2.93 |
| | | | | 3 | 27 | 714,344 | 238,114 | 1,666,804 | 10.32 |
| | | | | | | | | | |
| 6 | 3: Lower Hudson Valley | Putnam | 11 | 1 | 20 | 165,423 | 55,141 | 385,987 | 2.39 |
| | | Rockland | 9 | 1 | 26 | 307,619 | 102,539 | 717,779 | 4.44 |
| | | | | 2 | 29 | 473,042 | 157,680 | 1,103,766 | 6.83 |
| | | | | | | | | | |
| | | | | 18 | 31 | 6,921,452 | 2,307,146 | 16,150,065 | 100% |

3.9e. Releases by County

All 14 counties where compressor station are located reported releases of chemicals linked to circulatory system diseases.

Herkimer County ranked first with 3.7 million pounds or 23% of the state total, followed by Erie County (2.4 million pounds or 14.9%) and Schoharie (1.8 million pounds or 11.2%). These three counties are responsible for nearly one-half (49.1%) of all toxic releases.

The top five counties were responsible for 69%.

The 14-county average was 1,153,577 pounds.

Table 3.9e.

Diseases of the Circulatory System by County (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Rank | County | NYS DEC Region | 3 Years: 2008, 2011, 2014 | | | 7-Year Estimate: 2008-2014 | | |
|------|------------|--|---------------------------|-----------|------------------|----------------------------|-------------------|-------------|
| | | | Fac's | Ch's | Total Pounds | Average Pounds | Total Pounds | % |
| 1 | Herkimer | 6: Western Adirondacks/E. Lake Ontario | 2 | 30 | 1,592,828 | 530,943 | 3,716,599 | 23.01 |
| 2 | Erie | 9: Western New York | 2 | 23 | 1,032,703 | 344,234 | 2,409,640 | 14.92 |
| 3 | Schoharie | 4: Capital Region/Northern Catskills | 1 | 23 | 775,380 | 258,460 | 1,809,220 | 11.20 |
| 4 | Allegany | 9: Western New York | 2 | 14 | 710,077 | 236,692 | 1,656,847 | 10.26 |
| 5 | Onondaga | 7: Central New York | 1 | 22 | 689,628 | 229,876 | 1,609,133 | 9.96 |
| 6 | Ontario | 8: Western Finger Lakes | 1 | 5 | 485,953 | 161,984 | 1,133,891 | 7.02 |
| 7 | Columbia | 4: Capital Region/Northern Catskills | 1 | 15 | 443,700 | 147,900 | 1,035,300 | 6.41 |
| 8 | Chautauqua | 9: Western New York | 2 | 30 | 351,914 | 117,305 | 821,133 | 5.08 |
| 9 | Rockland | 3: Lower Hudson Valley | 1 | 26 | 307,620 | 102,540 | 717,779 | 4.44 |
| 10 | Steuben | 8: Western Finger Lakes | 1 | 27 | 202,675 | 67,558 | 472,907 | 2.93 |
| 11 | Putnam | 3: Lower Hudson Valley | 1 | 20 | 165,423 | 55,141 | 385,987 | 2.39 |
| 12 | Niagara | 9: Western New York | 1 | 15 | 77,706 | 25,902 | 181,314 | 1.12 |
| 13 | Tompkins | 7: Central New York | 1 | 19 | 60,135 | 20,045 | 140,315 | 0.87 |
| 14 | Livingston | 8: Western Finger Lakes | 1 | 15 | 25,717 | 8,572 | 60,007 | 0.37 |
| | | | 18 | 31 | 6,921,459 | 2,307,153 | 16,150,072 | 100% |

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3.10. Diseases of the Respiratory System (J00-J99)

3.10a. Releases by Chemical

Fifty-one of the 70 chemicals released by NYS natural gas compressor stations are associated with diseases of the respiratory system (ICD-10 Chapter 10). Releases of respiratory toxicants were reported by all 18 stations and totaled an estimated 39.6 million pounds from 2008 to 2014--an annual average of 5.7 million pounds.

Chemicals associated with respiratory system diseases represented 98.6% of releases by the state's natural gas compressor stations.

Thirty-five of these 51 chemicals are categorized as known human respiratory toxicants by one or more authoritative sources (U.S. ATSDR, U.S. NIOSH, U.S. OSHA, State of California OEHHA, or the European Union).

Nitrogen oxides ranked first with 18.1 million pounds or 46% of the total, followed by carbon monoxide (12.4 million pounds or 31.3%) and volatile organic compounds (4.9 million pounds or 12.5%). These three chemicals accounted for 35.4 million pounds or 89.7% of all releases.

The top 10 chemicals were responsible for 99.8% of all respiratory toxicants.

Table 3.10a.

Diseases of the Respiratory System by Chemical (Top 10 Chemicals by Pounds Released)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Chemical | | Location | | | 3 Years | 7 Year Estimate: 2008 to 2014 | | |
|----------|-----------------------------|----------|------|-------|------------|-------------------------------|------------|-------|
| Rank | Name | Fac's | Cn's | Reg's | Pounds | Average | Pounds | % |
| 1 | Nitrogen Oxides | 18 | 14 | 6 | 7,749,673 | 2,583,224 | 18,082,571 | 45.85 |
| 2 | Carbon Monoxide | 18 | 14 | 6 | 5,297,028 | 1,765,676 | 12,359,731 | 31.34 |
| 3 | Volatile Organic Compounds | 18 | 14 | 6 | 2,108,741 | 702,914 | 4,920,396 | 12.48 |
| 4 | Formaldehyde | 18 | 14 | 6 | 561,144 | 187,048 | 1,309,336 | 3.32 |
| 5 | PM10 Primary (Filt + Cond) | 18 | 14 | 6 | 539,890 | 179,963 | 1,259,744 | 3.19 |
| 6 | PM2.5 Primary (Filt + Cond) | 18 | 14 | 6 | 474,085 | 158,028 | 1,106,198 | 2.80 |
| 7 | Sulfur Dioxide | 18 | 14 | 6 | 80,048 | 26,683 | 186,778 | 0.47 |
| 8 | Acetaldehyde | 14 | 13 | 6 | 28,272 | 9,424 | 65,969 | 0.17 |
| 9 | Acrolein | 14 | 13 | 6 | 22,596 | 7,532 | 52,723 | 0.13 |
| 10 | Benzene | 16 | 13 | 6 | 9,103 | 3,034 | 21,241 | 0.05 |
| | | 18 | 14 | 6 | 16,870,580 | 5,623,527 | 39,364,686 | 99.81 |

3.10b. Releases by ICD Category

Respiratory system diseases are subdivided into 10 major groups. Chemicals released by natural gas compressor stations in NYS are positively associated with four of them. It should be remembered, that a single chemical can be associated with more than one category of disease.

J30-J39: Eleven chemicals are associated with other diseases of upper respiratory tract, including: epithelial cell hyperplasia of the larynx, mucous membrane irritation, nasal irritation, nasal lesions, nasal septum deviation and ulceration, perforated septum, pharynx irritation, and throat irritation. These were released by 18 facilities.

J40-J47: Twenty-three chemicals are associated with lung diseases due to external agents, including asthma and asthma-like allergy, bronchiolar constriction, bronchitis, bronchospasm, emphysema, and changes in pulmonary vascular resistance.

J68-J70: Twenty-five chemicals are associated with lung diseases due to external agents, including sensitization by inhalation, breathing difficulty and irregularities, bronchial irritation and pneumonia, chemical pneumonitis, exacerbation of preexisting breathing problems, pneumonia, and shortness of breath. These were released by 18 facilities.

J80-J84: Nine chemicals are associated with other respiratory diseases principally affecting the interstitium were released by all 18 facilities.

J95-J99: All fifty-one chemicals are associated with other or unspecified diseases of the respiratory system.

Table 3.10b.

Diseases of the Respiratory System by ICD Category (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| ICD-10 | | Facilities | | | | Chemicals | | | | Pounds | | | |
|--------|---|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------------|------------------|------------------|-------------------|
| # | Description | '08 | '11 | '14 | Tot | '08 | '11 | '14 | Tot | 2008 | 2011 | 2014 | Total |
| 1 | J00-J06 Acute upper respiratory infections | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 | J09-J18 Influenza and Pneumonia | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 | J20-J22 Other acute lower respiratory infections | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | J30-J39 Other diseases of upper respiratory tract | 18 | 18 | 17 | 18 | 11 | 11 | 11 | 11 | 2,387,918 | 3,244,839 | 2,721,747 | 8,354,505 |
| 5 | J40-J47 Chronic lower respiratory disease | 18 | 18 | 17 | 18 | 25 | 25 | 25 | 25 | 4,386,826 | 6,587,700 | 5,886,833 | 16,861,360 |
| 6 | J60-J70 Lung diseases due to external agents | 18 | 18 | 17 | 18 | 23 | 23 | 23 | 23 | 1,546,400 | 2,309,453 | 2,153,249 | 6,009,103 |
| 7 | J80-J84 Other respiratory diseases principally affecting the interstitium | 18 | 18 | 17 | 18 | 9 | 9 | 9 | 9 | 2,384,131 | 3,238,346 | 2,717,314 | 8,339,793 |
| 8 | J85-J86 Suppurative and necrotic conditions of lower respiratory tract | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9 | J90-J94 Other diseases of pleura | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10 | J95-J99 Other diseases of the respiratory system | 18 | 18 | 17 | 18 | 51 | 50 | 51 | 51 | 4,394,088 | 6,607,931 | 5,900,863 | 16,902,883 |
| | J00-J99 Total | 18 | 18 | 17 | 18 | 51 | 50 | 51 | 51 | 4,394,088 | 6,607,931 | 5,900,863 | 16,902,883 |

3.10c. Releases by Facility

All natural gas compressor stations in NYS reported releases chemical associated with respiratory system disease.

The top 6 polluters were facilities operated by the Tennessee Gas Pipeline Company.

Tennessee Gas Pipeline Company Compressor Station 245, ranked first with 10.4 million pounds or 26.2% of the state total. Two other compressor station operated by that company ranked second and third: Compressor Station 229 in Eden (5 million pounds or 12.7%) and Compressor Station 249 in Carlisle (4.2 million pounds or 10.7%). These three facilities were responsible for slightly less than one-half (49.6%) of the state total.

The top 5 facilities were responsible for 63% of all releases.

The facility average was 2.2 million pounds.

Table 3.10c.

Diseases of the Respiratory System by Facility (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Facility | | Location | | Chemicals | | | 7 Years (estimate) | | |
|----------|-----------------------|--------------------|------------|-----------|-----|-----|--------------------|------------|-------|
| Rank | Facility Name (Short) | Town | County | '08 | '11 | '14 | Average | Tot. Lbs. | % |
| 1 | TGPC CS 245 | Winfield | Herkimer | 38 | 37 | 23 | 1,484,234 | 10,389,639 | 26.21 |
| 2 | TGPC 229 & TEG DF | Eden | Erie | 37 | 35 | 36 | 721,422 | 5,049,951 | 12.74 |
| 3 | TGPC CS 249 | Carlisle | Schoharie | 38 | 24 | 24 | 604,524 | 4,231,665 | 10.67 |
| 4 | TGPC CS 241 | LaFayette | Onondaga | 37 | 27 | 36 | 425,243 | 2,976,701 | 7.51 |
| 5 | TGPC CS 254 | Chatham | Columbia | 24 | 15 | 8 | 337,862 | 2,365,031 | 5.97 |
| 6 | TGPC CS 237 | Manchester, Phelps | Ontario | 8 | 7 | 5 | 323,113 | 2,261,791 | 5.70 |
| 7 | AGT Stony Point CS | Stony Point | Rockland | 41 | 21 | 21 | 282,934 | 1,980,537 | 5.00 |
| 8 | NFGSC Concord CS | Concord | Erie | 10 | 9 | 11 | 243,583 | 1,705,081 | 4.30 |
| 9 | AGT SOUTHEAST CS | Southeast | Putnam | 24 | 17 | 33 | 233,542 | 1,634,796 | 4.12 |
| 10 | NFGSC Beech Hill CS | Willing | Allegany | 19 | 19 | 20 | 196,224 | 1,373,569 | 3.46 |
| 11 | NFGSC Independence CS | Andover | Allegany | 14 | 9 | 16 | 192,806 | 1,349,642 | 3.40 |
| 12 | TGPC CS 224 | Clymer | Chautauqua | 37 | 35 | 37 | 162,657 | 1,138,602 | 2.87 |
| 13 | DTI Woodhull Station | Woodhull | Steuben | 33 | 40 | 44 | 116,642 | 816,493 | 2.06 |
| 14 | DTI Borger CS | Ithaca | Tompkins | 33 | 33 | 18 | 110,772 | 775,401 | 1.96 |
| 15 | NFGSC Nashville CS | Hanover | Chautauqua | 27 | 27 | 0 | 88,588 | 620,115 | 1.56 |
| 16 | TGPC CS 230-C | Lockport | Niagara | 24 | 23 | 24 | 68,325 | 478,274 | 1.21 |
| 17 | DTI Utica Station | Frankfort | Herkimer | 27 | 31 | 43 | 39,738 | 278,165 | 0.70 |
| 18 | TGPC CS 233 | York | Livingston | 24 | 15 | 4 | 31,616 | 221,312 | 0.56 |
| | | | | 51 | 50 | 51 | 5,663,824 | 39,646,765 | 100% |

3.10d. Releases by DEC Region

The 18 compressor stations analyzed are in 6 of New York State's 9 DEC regions. All 6 regions had releases of chemicals associated with respiratory system diseases.

DEC Region 9, Western New York, ranked first with an estimated 29.2 million pounds (29.2%) of respiratory toxicants releases from 2008 to 2014. Region 6, Western Adirondacks/Eastern Lake Ontario, was a close second with 10.7 million pounds (27.05%).

Table 3.10d.

Diseases of the Respiratory System by DEC Region (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| NYS DEC Region | | County | | 3 Years: 2008, 2011, 2014 | | | 7-Year Estimate: 2008-2014 | | |
|----------------|-----------------------------------|------------|------|---------------------------|------|--------------|----------------------------|--------------|-------|
| Rank | Number \ Name | Name | Rank | Fac's | Ch's | Total Pounds | Average Pounds | Total Pounds | % |
| 1 | 9: Western New York | Allegany | 5 | 2 | 21 | 1,167,090 | 389,030 | 2,723,211 | 6.90 |
| | | Chautauqua | 10 | 2 | 49 | 665,147 | 221,715 | 1,552,011 | 3.94 |
| | | Erie | 2 | 2 | 40 | 2,895,013 | 965,004 | 6,755,032 | 17.13 |
| | | Niagara | 13 | 1 | 24 | 204,974 | 68,324 | 478,274 | 1.21 |
| | | | | 7 | 51 | 4,932,224 | 1,644,073 | 11,508,528 | 29.18 |
| 2 | 6: W Adirondacks / E Lake Ontario | Herkimer | 1 | 2 | 50 | 4,571,916 | 1,523,972 | 10,667,804 | 27.05 |
| 3 | 4: Capital Region / N. Catskills | Columbia | 6 | 1 | 24 | 1,013,584 | 337,861 | 2,365,030 | 6.00 |
| | | Schoharie | 3 | 1 | 38 | 1,813,570 | 604,523 | 4,231,665 | 10.73 |
| | | | | 2 | 44 | 2,827,154 | 942,384 | 6,596,695 | 16.73 |
| 4 | 7: Central New York | Onondaga | 4 | 1 | 37 | 1,275,728 | 425,242 | 2,976,700 | 7.55 |
| | | Tompkins | 12 | 1 | 33 | 332,314 | 110,771 | 775,401 | 1.97 |
| | | | | 2 | 51 | 1,608,042 | 536,013 | 3,752,101 | 9.51 |
| 6 | 3: Lower Hudson Valley | Putnam | 9 | 1 | 35 | 700,626 | 233,542 | 1,634,795 | 4.15 |
| | | Rockland | 8 | 1 | 42 | 848,801 | 282,933 | 1,980,536 | 5.02 |
| | | | | 2 | 48 | 1,549,427 | 516,475 | 3,615,331 | 9.17 |
| 5 | 8: Western Finger Lakes | Livingston | 14 | 1 | 24 | 94,848 | 31,616 | 221,312 | 0.56 |
| | | Ontario | 7 | 1 | 8 | 969,338 | 323,112 | 2,261,790 | 5.73 |
| | | Steuben | 11 | 1 | 45 | 349,925 | 116,641 | 816,492 | 2.07 |
| | | | | 3 | 45 | 1,414,111 | 471,369 | 3,299,594 | 8.37 |
| | | | | 18 | 51 | 16,902,874 | 5,634,286 | 39,440,053 | 100% |

3.10e. Releases by County

All 14 counties where compressor stations are located reported releases of chemicals linked to respiratory system diseases.

Herkimer County ranked first with 10.7 million pounds or 27% of the state total, followed by Erie County (6.8 million pounds or 17.1%) and Schoharie County (4.2 million pounds or 10.7%). These three counties are responsible for more than one-half (54.9%) of all toxic releases.

The top five counties were responsible for 69%.

Table 3.10e.

Diseases of the Respiratory System by County (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Rank | County | NYS DEC Region | 3 Years: 2008, 2011, 2014 | | | 7-Year Estimate: 2008-2014 | | |
|------|------------|--|---------------------------|-----------|-------------------|----------------------------|-------------------|-------------|
| | | | Fac's | Ch's | Total Pounds | Average Pounds | Total Pounds | % |
| 1 | Herkimer | 6: Western Adirondacks/E. Lake Ontario | 2 | 50 | 4,571,916 | 1,523,972 | 10,667,804 | 27.05 |
| 2 | Erie | 9: Western New York | 2 | 40 | 2,895,014 | 965,005 | 6,755,032 | 17.13 |
| 3 | Schoharie | 4: Capital Region/Northern Catskills | 1 | 38 | 1,813,571 | 604,524 | 4,231,665 | 10.73 |
| 4 | Onondaga | 7: Central New York | 1 | 37 | 1,275,729 | 425,243 | 2,976,701 | 7.55 |
| 5 | Allegany | 9: Western New York | 2 | 21 | 1,167,091 | 389,030 | 2,723,212 | 6.90 |
| 6 | Columbia | 4: Capital Region/Northern Catskills | 1 | 24 | 1,013,585 | 337,862 | 2,365,031 | 6.00 |
| 7 | Ontario | 8: Western Finger Lakes | 1 | 8 | 969,339 | 323,113 | 2,261,791 | 5.73 |
| 8 | Rockland | 3: Lower Hudson Valley | 1 | 42 | 848,801 | 282,934 | 1,980,537 | 5.02 |
| 9 | Putnam | 3: Lower Hudson Valley | 1 | 35 | 700,627 | 233,542 | 1,634,796 | 4.15 |
| 10 | Chautauqua | 9: Western New York | 2 | 49 | 665,148 | 221,716 | 1,552,012 | 3.94 |
| 11 | Steuben | 8: Western Finger Lakes | 1 | 45 | 349,925 | 116,642 | 816,493 | 2.07 |
| 12 | Tompkins | 7: Central New York | 1 | 33 | 332,315 | 110,772 | 775,401 | 1.97 |
| 13 | Niagara | 9: Western New York | 1 | 24 | 204,975 | 68,325 | 478,274 | 1.21 |
| 14 | Livingston | 8: Western Finger Lakes | 1 | 24 | 94,848 | 31,616 | 221,312 | 0.56 |
| | | | 18 | 51 | 16,902,883 | 5,634,294 | 39,440,060 | 100% |

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3.11. Diseases of the Digestive System (K00-K93)

3.11a. Releases by Chemical

Fifty-two of the 70 chemicals released by NYS natural gas compressor stations are associated with digestive diseases (ICD-10 Chapter 11). Releases of digestive system toxicants were reported by all 18 stations and totaled an estimated 38.2 million pounds from 2008 to 2014--an annual average of 5.5 million pounds.

Chemicals associated with digestive system diseases represented 95.7% of releases by the state's natural gas compressor stations.

Nitrogen oxides ranked first with 18.1 million pounds or 47.3% of the total, followed by carbon monoxide (12.4 million pounds or 32.3%) and volatile organic compounds (4.9 million pounds or 12.9%). These three chemicals accounted for 35.4 million pounds or 92.4% of all releases.

The top 10 chemicals were responsible for 99.9% of all digestive toxicants.

The average annual release was 5.5 million pounds.

Table 3.11a.

Diseases of the Digestive System by Chemical (Top 10 Chemicals by Pounds Released)

NYS Natural Gas Compressor Stations, 2008-2014

| Chemical | | Location | | | 3 Years | 7 Year Estimate: 2008 to 2014 | | |
|----------|----------------------------|----------|------|-------|------------|-------------------------------|------------|-------|
| Rank | Name | Fac's | Cn's | Reg's | Pounds | Average | Pounds | % |
| 1 | Nitrogen Oxides | 18 | 14 | 6 | 7,749,673 | 2,583,224 | 18,082,571 | 47.25 |
| 2 | Carbon Monoxide | 18 | 14 | 6 | 5,297,028 | 1,765,676 | 12,359,731 | 32.30 |
| 3 | Volatile Organic Compounds | 18 | 14 | 6 | 2,108,741 | 702,914 | 4,920,396 | 12.86 |
| 4 | Formaldehyde | 18 | 14 | 6 | 561,144 | 187,048 | 1,309,336 | 3.42 |
| 5 | PM10 Primary (Filt + Cond) | 18 | 14 | 6 | 539,890 | 179,963 | 1,259,744 | 3.29 |
| 6 | Sulfur Dioxide | 18 | 14 | 6 | 80,048 | 26,683 | 186,778 | 0.49 |
| 7 | Acrolein | 14 | 13 | 6 | 22,596 | 7,532 | 52,723 | 0.14 |
| 8 | Benzene | 16 | 13 | 6 | 9,103 | 3,034 | 21,241 | 0.06 |
| 9 | Methanol | 8 | 7 | 6 | 8,286 | 2,762 | 19,333 | 0.05 |
| 10 | Toluene | 16 | 13 | 6 | 8,275 | 2,758 | 19,308 | 0.05 |
| | | 18 | 14 | 6 | 16,384,783 | 5,461,594 | 38,231,160 | 99.9 |

3.11b. Releases by ICD Category

Digestive system diseases are subdivided into 9 major groups. Chemicals released by natural gas compressor stations in NYS are positively associated with 8 of them. It should be remembered, that a single chemical can be associated with more than one category of disease.

K00-K31: Seven chemicals are associated with diseases of esophagus, stomach and duodenum, including esophagus (change in structure or function of the esophagus, esophageal inflammation and ulceration, gastritis, and stomach bleeding. All 18 facilities reported releases.

K35-K38: Two chemicals are associated with diseases of the appendix.

K50-K52: Three chemicals are associated with noninfective enteritis and colitis.

K55-K63: Three chemicals are associated with other diseases of intestines, including enteric disease and small intestine (ulceration or bleeding).

K65-K67: A single chemical is associated with diseases of peritoneum.

K70-K77: Twenty-four chemicals are associated with diseases of the liver, including cirrhosis, hepatitis, and liver damage, fatty degeneration, function impairment, injury, swelling, and weight changes.

K80-K87: Three chemicals are associated with disorders of gallbladder, biliary tract and pancreas.

K90-K93: Thirty-eight chemicals are associated with other diseases of the digestive system.

Table 3.11b.

K00-K93: Diseases of the Digestive System by ICD Code Group

NYS Natural Gas Compressor Stations, 2008-2014

| ICD-10 | | | Facilities | | | | Chemicals | | | | Pounds | | | |
|--------|--|--|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------------|------------------|------------------|-------------------|
| # | Description | | '08 | '11 | '14 | Tot | '08 | '11 | '14 | Tot | 2008 | 2011 | 2014 | Total |
| 1 | K00-K14 Diseases of oral cavity, salivary glands and jaws | | | | | | | | | | | | | |
| 2 | K20-K31 Diseases of esophagus, stomach and duodenum | | 18 | 18 | 16 | 18 | 7 | 7 | 7 | 7 | 112,677 | 234,109 | 224,355 | 571,142 |
| 3 | K35-K38 Diseases of appendix | | 18 | 18 | 17 | 18 | 2 | 2 | 2 | 2 | 2,377,287 | 3,235,327 | 2,676,948 | 8,289,563 |
| 4 | K50-K52 Noninfective enteritis and colitis | | 18 | 18 | 17 | 18 | 3 | 3 | 3 | 3 | 2,276,943 | 3,007,254 | 2,545,586 | 7,829,785 |
| 5 | K55-K63 Other diseases of intestines | | 18 | 18 | 17 | 18 | 3 | 3 | 3 | 3 | 1,416,050 | 2,030,806 | 1,850,560 | 5,297,417 |
| 6 | K65-K67 Diseases of peritoneum | | 6 | 4 | 5 | 8 | 1 | 1 | 1 | 1 | 23 | 59 | 37 | 120 |
| 7 | K70-K77 Diseases of liver | | 18 | 18 | 17 | 18 | 24 | 24 | 24 | 24 | 488,496 | 1,073,708 | 1,133,230 | 2,695,435 |
| 8 | K80-K87 Disorders of gallbladder, biliary tract and pancreas | | 16 | 15 | 13 | 16 | 3 | 3 | 3 | 3 | 3,428 | 8,249 | 5,811 | 17,488 |
| 9 | K90-K93 Other diseases of the digestive system | | 18 | 18 | 17 | 18 | 38 | 38 | 38 | 38 | 127,387 | 272,114 | 300,025 | 699,527 |
| | K00-K93 Total | | 18 | 18 | 17 | 18 | 45 | 45 | 45 | 45 | 4,297,063 | 6,371,787 | 5,731,539 | 16,400,390 |

3.11c. Releases by Facility

All natural gas compressor stations in NYS reported releases chemical associated with diseases of the digestive system.

The top 6 polluters were facilities operated by the Tennessee Gas Pipeline Company.

Tennessee Gas Pipeline Company Compressor Station 245, ranked first with 10.2 million pounds or 26.5% of the state total. Two other compressor station operated by that company ranked second and third: Compressor Station 229 in Eden (4.9 million pounds or 12.7%) and Compressor Station 249 in Carlisle (4 million pounds or 10.5%). These three facilities were responsible for slightly less than one-half (49.6%) of the state total.

The top 5 facilities were responsible for 63% of all releases.

The facility average was 2.1 million pounds.

Table 3.11c.

K00-K93: Diseases of the Digestive System by Facility (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Facility | | Location | | Chemicals | | | 7 Years (estimate) | | |
|----------|-----------------------|--------------------|------------|-----------|-----|-----|--------------------|------------|-------|
| Rank | Facility Name (Short) | Town | County | '08 | '11 | '14 | Average | Tot. Lbs. | % |
| 1 | TGPC CS 245 | Winfield | Herkimer | 35 | 35 | 21 | 1,453,762 | 10,176,331 | 26.45 |
| 2 | TGPC 229 & TEG DF | Eden | Erie | 34 | 33 | 34 | 698,204 | 4,887,431 | 12.70 |
| 3 | TGPC CS 249 | Carlisle | Schoharie | 35 | 22 | 22 | 576,081 | 4,032,565 | 10.48 |
| 4 | TGPC CS 241 | LaFayette | Onondaga | 34 | 26 | 34 | 406,862 | 2,848,035 | 7.40 |
| 5 | TGPC CS 254 | Chatham | Columbia | 21 | 13 | 7 | 329,499 | 2,306,496 | 6.00 |
| 6 | TGPC CS 237 | Manchester, Phelps | Ontario | 7 | 6 | 5 | 313,810 | 2,196,672 | 5.71 |
| 7 | AGT Stony Point CS | Stony Point | Rockland | 36 | 19 | 19 | 273,624 | 1,915,369 | 4.98 |
| 8 | NFGSC Concord CS | Concord | Erie | 9 | 8 | 10 | 234,664 | 1,642,645 | 4.27 |
| 9 | AGT SOUTHEAST CS | Southeast | Putnam | 21 | 15 | 29 | 222,553 | 1,557,873 | 4.05 |
| 10 | NFGSC Beech Hill CS | Willing | Allegany | 17 | 17 | 18 | 192,242 | 1,345,695 | 3.50 |
| 11 | NFGSC Independence CS | Andover | Allegany | 13 | 8 | 15 | 191,487 | 1,340,411 | 3.48 |
| 12 | TGPC CS 224 | Clymer | Chautauqua | 35 | 33 | 35 | 158,556 | 1,109,894 | 2.88 |
| 13 | DTI Woodhull Station | Woodhull | Steuben | 29 | 37 | 41 | 111,868 | 783,073 | 2.04 |
| 14 | DTI Borger CS | Ithaca | Tompkins | 29 | 29 | 16 | 110,016 | 770,114 | 2.00 |
| 15 | NFGSC Nashville CS | Hanover | Chautauqua | 24 | 24 | 0 | 87,732 | 614,122 | 1.60 |
| 16 | TGPC CS 230-C | Lockport | Niagara | 21 | 20 | 21 | 66,076 | 462,535 | 1.20 |
| 17 | DTI Utica Station | Frankfort | Herkimer | 24 | 27 | 40 | 38,557 | 269,902 | 0.70 |
| 18 | TGPC CS 233 | York | Livingston | 21 | 13 | 4 | 30,446 | 213,124 | 0.55 |
| | | | | 45 | 45 | 45 | 5,496,041 | 38,472,286 | 100% |

3.11d. Releases by DEC Region

The 18 compressor stations analyzed are in 6 of New York State's 9 DEC regions. All 6 regions had releases of chemicals associated with respiratory system diseases.

DEC Region 9, Western New York, ranked first with an estimated 11.2 million pounds (29.3%) of digestive toxicants releases from 2008 to 2014. Region 6, Western Adirondacks/Eastern Lake Ontario, was a close second with 10.5 million pounds (27.3%), followed by Region 4, Capital Region/Northern Catskills (6.4 million pounds or 16.5%).

Table 3.11d.

K00-K93: Diseases of the Digestive System by DEC Region (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| NYS DEC Region | | County | | 3 Years: 2008, 2011, 2014 | | | 7-Year Estimate: 2008-2014 | | |
|----------------|-----------------------------------|------------|------|---------------------------|------|--------------|----------------------------|--------------|-------|
| Rank | Number \ Name | Name | Rank | Fac's | Ch's | Total Pounds | Average Pounds | Total Pounds | % |
| 1 | 9: Western New York | Allegany | 5 | 2 | 19 | 1,151,188 | 383,729 | 2,686,106 | 7.02 |
| | | Chautauqua | 10 | 2 | 44 | 651,132 | 217,044 | 1,519,309 | 3.97 |
| | | Erie | 2 | 2 | 37 | 2,798,604 | 932,868 | 6,530,076 | 17.06 |
| | | Niagara | 13 | 1 | 21 | 198,229 | 66,076 | 462,535 | 1.21 |
| | | | | 7 | 45 | 4,799,154 | 1,599,718 | 11,198,026 | 29.26 |
| 2 | 6: W Adirondacks / E Lake Ontario | Herkimer | 1 | 2 | 44 | 4,476,957 | 1,492,319 | 10,446,232 | 27.30 |
| 3 | 4: Capital Region / N Catskills | Columbia | 6 | 1 | 21 | 988,498 | 329,499 | 2,306,496 | 6.03 |
| | | Schoharie | 3 | 1 | 35 | 1,728,242 | 576,081 | 4,032,565 | 10.54 |
| | | | | 2 | 39 | 2,716,740 | 905,580 | 6,339,060 | 16.57 |
| 4 | 7: Central New York | Onondaga | 4 | 1 | 34 | 1,220,586 | 406,862 | 2,848,035 | 7.44 |
| | | Tompkins | 12 | 1 | 29 | 330,049 | 110,016 | 770,114 | 2.01 |
| | | | | 2 | 45 | 1,550,635 | 516,878 | 3,618,149 | 9.45 |
| 6 | 3: Lower Hudson Valley | Putnam | 9 | 1 | 31 | 667,660 | 222,553 | 1,557,873 | 4.07 |
| | | Rockland | 8 | 1 | 37 | 820,872 | 273,624 | 1,915,369 | 5.01 |
| | | | | 2 | 45 | 1,488,532 | 496,177 | 3,473,242 | 9.08 |
| 5 | 8: Western Finger Lakes | Livingston | 14 | 1 | 21 | 91,339 | 30,446 | 213,124 | 0.56 |
| | | Ontario | 7 | 1 | 7 | 941,431 | 313,810 | 2,196,672 | 5.74 |
| | | Steuben | 11 | 1 | 42 | 335,603 | 111,868 | 783,073 | 2.05 |
| | | | | 3 | 42 | 1,368,372 | 456,124 | 3,192,869 | 8.34 |
| | | | | 18 | 45 | 16,400,391 | 5,466,797 | 38,267,578 | 100% |

3.11e. Releases by County

All 14 counties where compressor stations are located reported releases of chemicals linked to digestive system diseases.

Herkimer County ranked first with 10.5 million pounds or 27.3% of the state total, followed by Erie County (6.5 million pounds or 17.1%) and Schoharie County (4 million pounds or 10.5%). These three counties are responsible for more than one-half (54.9%) of all toxic releases.

The top five counties were responsible for 69.4%.

The country average was 2.7 million pounds.

Table 3.11e.

K00-K93: Diseases of the Digestive System by County (ranked)

NYS Natural Gas Compressor Stations, 2008-2014

| Rank | County | NYS DEC Region | 3 Years: 2008, 2011, 2014 | | | 7-Year Estimate: 2008-2014 | | |
|------|------------|--|---------------------------|-----------|-------------------|----------------------------|-------------------|-------------|
| | | | Fac's | Ch's | Total Pounds | Average Pounds | Total Pounds | % |
| 1 | Herkimer | 6: Western Adirondacks/E. Lake Ontario | 2 | 44 | 4,476,956 | 1,492,318 | 10,446,232 | 27.30 |
| 2 | Erie | 9: Western New York | 2 | 37 | 2,798,604 | 932,868 | 6,530,076 | 17.06 |
| 3 | Schoharie | 4: Capital Region/Northern Catskills | 1 | 35 | 1,728,242 | 576,080 | 4,032,564 | 10.54 |
| 4 | Onondaga | 7: Central New York | 1 | 34 | 1,220,586 | 406,862 | 2,848,034 | 7.44 |
| 5 | Allegany | 9: Western New York | 2 | 19 | 1,151,188 | 383,729 | 2,686,105 | 7.02 |
| 6 | Columbia | 4: Capital Region/Northern Catskills | 1 | 21 | 988,498 | 329,499 | 2,306,495 | 6.03 |
| 7 | Ontario | 8: Western Finger Lakes | 1 | 7 | 941,430 | 313,810 | 2,196,671 | 5.74 |
| 8 | Rockland | 3: Lower Hudson Valley | 1 | 37 | 820,872 | 273,624 | 1,915,369 | 5.01 |
| 9 | Putnam | 3: Lower Hudson Valley | 1 | 31 | 667,659 | 222,553 | 1,557,872 | 4.07 |
| 10 | Chautauqua | 9: Western New York | 2 | 44 | 651,132 | 217,044 | 1,519,309 | 3.97 |
| 11 | Steuben | 8: Western Finger Lakes | 1 | 42 | 335,602 | 111,867 | 783,072 | 2.05 |
| 12 | Tompkins | 7: Central New York | 1 | 29 | 330,048 | 110,016 | 770,113 | 2.01 |
| 13 | Niagara | 9: Western New York | 1 | 21 | 198,229 | 66,076 | 462,534 | 1.21 |
| 14 | Livingston | 8: Western Finger Lakes | 1 | 21 | 91,338 | 30,446 | 213,124 | 0.56 |
| | | | 18 | 45 | 16,400,384 | 5,466,792 | 38,267,570 | 100% |

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3.12. Diseases of the Skin and Subcutaneous Tissue (L00-L99)

3.12a. Releases by Chemical

Forty-eight of the 70 chemicals released by NYS natural gas compressor stations are associated with skin and subcutaneous tissue diseases (ICD-10 Chapter 12). Releases of these toxicants were reported by all 18 stations and totaled an estimated 27.6 million pounds from 2008 to 2014--an annual average of 3.9 million pounds.

Chemicals associated with diseases of the skin and subcutaneous tissue represented 69% of releases by the state's natural gas compressor stations.

Nitrogen oxides ranked first with 18.1 million pounds or slightly less than two-thirds (65.6%) of the total, followed by volatile organic compounds (4.9 million pounds or 17.8%) and formaldehyde (1.3 million pounds or 4.8%). These three chemicals accounted for 24.3 million pounds or 88.2 of all releases.

The top 10 chemicals were responsible for 96.6% of all cutaneous and subcutaneous toxicants.

Table 3.12a.

Diseases of the Skin and Subcutaneous Tissue (Top 10 Chemicals by Pounds Released)

NYS Natural Gas Compressor Stations, 2008-2014

| Chemical | | Location | | | 3 Years | 7 Year Estimate: 2008 to 2014 | | |
|----------|-----------------------------|----------|------|-------|------------|-------------------------------|------------|-------|
| Rank | Name | Fac's | Cn's | Reg's | Pounds | Average | Pounds | % |
| 1 | Nitrogen Oxides | 18 | 14 | 6 | 7,749,673 | 2,583,224 | 18,082,571 | 65.56 |
| 2 | Volatile Organic Compounds | 18 | 14 | 6 | 2,108,741 | 702,914 | 4,920,396 | 17.84 |
| 3 | Formaldehyde | 18 | 14 | 6 | 561,144 | 187,048 | 1,309,336 | 4.75 |
| 4 | PM10 Primary (Filt + Cond) | 18 | 14 | 6 | 539,890 | 179,963 | 1,259,744 | 4.57 |
| 5 | PM2.5 Primary (Filt + Cond) | 18 | 14 | 6 | 474,085 | 158,028 | 1,106,198 | 4.01 |
| 6 | PM Condensable | 18 | 14 | 6 | 231,543 | 77,181 | 540,267 | 1.96 |
| 7 | Sulfur Dioxide | 18 | 14 | 6 | 80,048 | 26,683 | 186,778 | 0.68 |
| 8 | Acetaldehyde | 14 | 13 | 6 | 28,272 | 9,424 | 65,969 | 0.24 |
| 9 | Acrolein | 14 | 13 | 6 | 22,596 | 7,532 | 52,723 | 0.19 |
| 10 | Benzene | 16 | 13 | 6 | 9,103 | 3,034 | 21,241 | 0.08 |
| | | 18 | 14 | 6 | 11,805,095 | 3,935,032 | 27,545,222 | 99.87 |

3.12b. Releases by ICD Category

Skin and subcutaneous diseases are subdivided into 8 major groups. Chemicals released by natural gas compressor stations in NYS are positively associated with 3 of them. It should be remembered, that a single chemical can be associated with more than one category of disease.

L20-L30: Seven chemicals are associated with dermatitis and eczema.

L50-L54: Five chemicals are associated with urticaria and erythema.

L80-L99: Forty-seven chemicals are associated with other disorders of the skin and subcutaneous tissue.

Table 3.12b.

L00-L99: Diseases of the Skin and Subcutaneous Tissue by ICD Category

NYS Natural Gas Compressor Stations, 2008-2014

| ICD-10 | | | Facilities | | | | Chemicals | | | | Pounds | | | |
|--------|----------------|---|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------------|------------------|------------------|-------------------|
| # | Description | | '08 | '11 | '14 | Tot | '08 | '11 | '14 | Tot | 2008 | 2011 | 2014 | Total |
| 1 | L00-L08 | Infections of the skin and subcutaneous tissue | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 | L10-L14 | Bullous disorders | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 | L20-L30 | Dermatitis and eczema | 18 | 18 | 17 | 18 | 7 | 7 | 7 | 7 | 489,047 | 1,076,977 | 1,132,330 | 2,698,356 |
| 4 | L40-L45 | Papulosquamous disorders | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | L50-L54 | Urticaria and erythema | 18 | 18 | 17 | 18 | 5 | 5 | 5 | 5 | 376,503 | 833,995 | 904,262 | 2,114,761 |
| 6 | L55-L59 | Radiation-related disorders of the skin and subcutaneous tissue | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7 | L60-L75 | Disorders of skin appendages | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8 | L80-L99 | Other disorders of the skin and subcutaneous tissue | 18 | 18 | 17 | 18 | 45 | 46 | 46 | 47 | 2,646,996 | 3,854,819 | 3,226,706 | 9,728,523 |
| | L00-L99 | Total | 18 | 18 | 17 | 18 | 46 | 47 | 47 | 48 | 3,021,274 | 4,686,735 | 4,129,254 | 11,837,264 |

3.12c. Releases by Facility

All natural gas compressor stations in NYS reported releases chemical associated with diseases of the skin and subcutaneous tissue diseases.

The top 5 polluters were facilities operated by the Tennessee Gas Pipeline Company.

Tennessee Gas Pipeline Company Compressor Station 245, ranked first with 7.6 million pounds or 27.2% of the state total, followed by Compressor Station 229 in Eden (4.1 million pounds or 14.8%) and Compressor Station 249 in Carlisle (3.1 million pounds or 11.1%). These three facilities were responsible for slightly less than one-half (53.1%) of the state total.

The top 5 facilities were responsible for slightly less than two-thirds (65.3%) of all releases.

The facility average was 1.5 million pounds.

Table 3.12c.

L00-L99: Diseases of the Skin and Subcutaneous Tissue by Facility (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Facility | | Location | | Chemicals | | | 7 Years (estimate) | | |
|----------|-----------------------|--------------------|------------|-----------|-----------|-----------|--------------------|-------------------|-------------|
| Rank | Facility Name (Short) | Town | County | '08 | '11 | '14 | Average | Tot. Lbs. | % |
| 1 | TGPC CS 245 | Winfield | Herkimer | 35 | 35 | 22 | 1,079,145 | 7,554,017 | 27.23 |
| 2 | TGPC 229 & TEG DF | Eden | Erie | 35 | 34 | 35 | 586,143 | 4,103,000 | 14.79 |
| 3 | TGPC CS 249 | Carlisle | Schoharie | 35 | 23 | 23 | 438,754 | 3,071,281 | 11.07 |
| 4 | TGPC CS 241 | LaFayette | Onondaga | 34 | 26 | 34 | 268,300 | 1,878,097 | 6.77 |
| 5 | TGPC CS 254 | Chatham | Columbia | 22 | 15 | 8 | 215,885 | 1,511,192 | 5.45 |
| 6 | AGT Stony Point CS | Stony Point | Rockland | 38 | 21 | 21 | 215,264 | 1,506,847 | 5.43 |
| 7 | AGT SOUTHEAST CS | Southeast | Putnam | 22 | 17 | 32 | 214,802 | 1,503,616 | 5.42 |
| 8 | TGPC CS 237 | Manchester, Phelps | Ontario | 8 | 7 | 4 | 203,966 | 1,427,759 | 5.15 |
| 9 | NFGSC Concord CS | Concord | Erie | 10 | 9 | 11 | 150,324 | 1,052,268 | 3.79 |
| 10 | NFGSC Independence CS | Andover | Allegany | 14 | 9 | 16 | 98,457 | 689,200 | 2.48 |
| 11 | DTI Borger CS | Ithaca | Tompkins | 31 | 32 | 18 | 93,789 | 656,521 | 2.37 |
| 12 | TGPC CS 224 | Clymer | Chautauqua | 35 | 33 | 35 | 91,319 | 639,232 | 2.30 |
| 13 | NFGSC Beech Hill CS | Willing | Allegany | 19 | 19 | 20 | 83,888 | 587,216 | 2.12 |
| 14 | DTI Woodhull Station | Woodhull | Steuben | 31 | 40 | 44 | 68,499 | 479,496 | 1.73 |
| 15 | NFGSC Nashville CS | Hanover | Chautauqua | 25 | 24 | 0 | 52,218 | 365,527 | 1.32 |
| 16 | TGPC CS 230-C | Lockport | Niagara | 22 | 21 | 22 | 48,326 | 338,285 | 1.22 |
| 17 | DTI Utica Station | Frankfort | Herkimer | 25 | 30 | 43 | 28,034 | 196,235 | 0.71 |
| 18 | TGPC CS 233 | York | Livingston | 22 | 15 | 3 | 26,048 | 182,337 | 0.66 |
| | | | | 46 | 46 | 47 | 3,963,161 | 27,742,125 | 100% |

3.12d. Releases by DEC Region

The 18 compressor stations analyzed are in 6 of New York State's 9 DEC regions. All 6 regions had releases of chemicals associated with skin and subcutaneous tissue diseases.

DEC Region 6, Western Adirondacks/Eastern Lake Ontario, ranked first with 7,750,252 pounds (28.1%), closely followed by Region 9, Western New York (7,652,886 pounds or 27.7%). Region 4, Capital Region/Northern Catskills ranked third with 4.6 million pounds (16.6%).

Table 3.12d.

L00-L99: Diseases of the Skin and Subcutaneous Tissue by DEC Region (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| NYS DEC Region | | County | | 3 Years: 2008, 2011, 2014 | | | 7-Year Estimate: 2008-2014 | | |
|----------------|-----------------------------------|------------|------|---------------------------|------|--------------|----------------------------|--------------|-------|
| Rank | Number \ Name | Name | Rank | Fac's | Ch's | Total Pounds | Average Pounds | Total Pounds | % |
| 2 | 6: W Adirondacks / E Lake Ontario | Herkimer | 1 | 2 | 47 | 3,321,537 | 1,107,179 | 7,750,252 | 28.06 |
| 1 | 9: Western New York | Allegany | 9 | 2 | 21 | 547,036 | 182,345 | 1,276,416 | 4.62 |
| | | Chautauqua | 10 | 2 | 45 | 378,393 | 126,131 | 882,916 | 3.20 |
| | | Erie | 2 | 2 | 38 | 2,209,400 | 736,467 | 5,155,268 | 18.66 |
| | | Niagara | 13 | 1 | 22 | 144,979 | 48,326 | 338,285 | 1.22 |
| | | | | 7 | 46 | 3,279,808 | 1,093,269 | 7,652,886 | 27.71 |
| 3 | 4: Capital Region / N Catskills | Columbia | 5 | 1 | 22 | 647,654 | 215,885 | 1,511,192 | 5.47 |
| | | Schoharie | 3 | 1 | 35 | 1,316,263 | 438,754 | 3,071,281 | 11.12 |
| | | | | 2 | 39 | 1,963,917 | 654,639 | 4,582,474 | 16.59 |
| 6 | 3: Lower Hudson Valley | Putnam | 7 | 1 | 34 | 644,407 | 214,802 | 1,503,616 | 5.44 |
| | | Rockland | 6 | 1 | 39 | 645,792 | 215,264 | 1,506,847 | 5.46 |
| | | | | 2 | 45 | 1,290,198 | 430,066 | 3,010,463 | 10.90 |
| 4 | 7: Central New York | Onondaga | 4 | 1 | 34 | 804,899 | 268,300 | 1,878,097 | 6.80 |
| | | Tompkins | 11 | 1 | 33 | 281,366 | 93,789 | 656,521 | 2.38 |
| | | | | 2 | 48 | 1,086,265 | 362,088 | 2,534,617 | 9.18 |
| 5 | 8: Western Finger Lakes | Livingston | 14 | 1 | 22 | 78,144 | 26,048 | 182,337 | 0.66 |
| | | Ontario | 8 | 1 | 8 | 611,897 | 203,966 | 1,427,759 | 5.17 |
| | | Steuben | 12 | 1 | 46 | 205,498 | 68,499 | 479,496 | 1.74 |
| | | | | 3 | 46 | 895,539 | 298,513 | 2,089,592 | 7.57 |
| | | | | 18 | 48 | 11,837,264 | 3,945,755 | 27,620,283 | 100% |

3.12e. Releases by County

All 14 counties where compressor stations are located reported releases of chemicals linked to cutaneous and subcutaneous diseases.

Herkimer County ranked first with 7.8 million pounds or 28.1% of the state total, followed by Erie County (5.2 million pounds or 18.7%) and Schoharie County (3.1 million pounds or 11.1%). These three counties are responsible for more than one-half (57.8%) of all toxic releases.

The top five counties were responsible for 70%.

The country average was 2 million pounds.

Table 3.12e

Diseases of the Skin and Subcutaneous Tissue by County (ranked)

NYS Natural Gas Compressor Stations, 2008-2014

| Rank | County | NYS DEC Region | 3 Years: 2008, 2011, 2014 | | | 7-Year Estimate: 2008-2014 | | |
|------|------------|--|---------------------------|-----------|-------------------|----------------------------|-------------------|-------------|
| | | | Fac's | Ch's | Total Pounds | Average Pounds | Total Pounds | % |
| 1 | Herkimer | 6: Western Adirondacks/E. Lake Ontario | 2 | 47 | 3,321,537 | 1,107,179 | 7,750,252 | 28.06 |
| 2 | Erie | 9: Western New York | 2 | 38 | 2,209,400 | 736,467 | 5,155,268 | 18.66 |
| 3 | Schoharie | 4: Capital Region/Northern Catskills | 1 | 35 | 1,316,263 | 438,754 | 3,071,281 | 11.12 |
| 4 | Onondaga | 7: Central New York | 1 | 34 | 804,899 | 268,300 | 1,878,097 | 6.80 |
| 5 | Columbia | 4: Capital Region/Northern Catskills | 1 | 22 | 647,654 | 215,885 | 1,511,192 | 5.47 |
| 6 | Rockland | 3: Lower Hudson Valley | 1 | 39 | 645,792 | 215,264 | 1,506,847 | 5.46 |
| 7 | Putnam | 3: Lower Hudson Valley | 1 | 34 | 644,407 | 214,802 | 1,503,616 | 5.44 |
| 8 | Ontario | 8: Western Finger Lakes | 1 | 8 | 611,897 | 203,966 | 1,427,759 | 5.17 |
| 9 | Allegany | 9: Western New York | 2 | 21 | 547,036 | 182,345 | 1,276,416 | 4.62 |
| 10 | Chautauqua | 9: Western New York | 2 | 45 | 378,393 | 126,131 | 882,916 | 3.20 |
| 11 | Tompkins | 7: Central New York | 1 | 33 | 281,366 | 93,789 | 656,521 | 2.38 |
| 12 | Steuben | 8: Western Finger Lakes | 1 | 46 | 205,498 | 68,499 | 479,496 | 1.74 |
| 13 | Niagara | 9: Western New York | 1 | 22 | 144,979 | 48,326 | 338,285 | 1.22 |
| 14 | Livingston | 8: Western Finger Lakes | 1 | 22 | 78,144 | 26,048 | 182,337 | 0.66 |
| | | | 18 | 48 | 11,837,264 | 3,945,755 | 27,620,283 | 100% |

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3.13. Diseases of the Musculoskeletal System and Connective Tissue (M00-M99)

3.13a. Releases by Chemical

Seventeen of the 70 chemicals released by NYS natural gas compressor stations are associated with musculoskeletal system and connective tissue diseases (ICD-10 Chapter 13). Releases of these toxicants were reported by all 18 stations and totaled an estimated 1.2 million pounds from 2008 to 2014--an annual average of 3.9 million pounds.

Chemicals associated with musculoskeletal system and connective tissue diseases represented 3.1% of releases by the state's natural gas compressor stations.

PM 2.5 ranked first with 1.1 million pounds or 92.6% of the total, followed by benzene (21,241 pounds or 1.8%) and methanol (19,333 pounds or 1.6%). These three chemicals accounted for 96% of all releases.

Table 3.13a.

Diseases of the Musculoskeletal System and Connective Tissue by Chemical

NYS Natural Gas Compressor Stations, 2008-2014

| Chemical | | Location | | | 3 Years | 7 Year Estimate: 2008 to 2014 | | |
|----------|-----------------------------|----------|------|-------|---------|-------------------------------|-----------|-------|
| Rank | Name | Fac's | Cn's | Reg's | Pounds | Average | Pounds | % |
| 1 | PM2.5 Primary (Filt + Cond) | 18 | 14 | 6 | 474,085 | 158,028 | 1,106,198 | 92.62 |
| 2 | Benzene | 16 | 13 | 6 | 9,103 | 3,034 | 21,241 | 1.78 |
| 3 | Methanol | 8 | 7 | 6 | 8,286 | 2,762 | 19,333 | 1.62 |
| 4 | Toluene | 16 | 13 | 6 | 8,275 | 2,758 | 19,308 | 1.62 |
| 5 | Hexane | 13 | 10 | 6 | 5,222 | 1,741 | 12,184 | 1.02 |
| 6 | Xylenes (Mixed Isomers) | 15 | 13 | 6 | 3,598 | 1,199 | 8,394 | 0.70 |
| 7 | 1,3-Butadiene | 14 | 13 | 6 | 2,022 | 674 | 4,719 | 0.40 |
| 8 | Ammonia | 8 | 7 | 5 | 674 | 225 | 1,573 | 0.13 |
| 9 | Propylene Oxide | 8 | 8 | 5 | 263 | 88 | 615 | 0.05 |
| 10 | Carbon Tetrachloride | 8 | 7 | 6 | 121 | 40 | 282 | 0.02 |
| 11 | Chloroform | 9 | 8 | 6 | 83 | 28 | 193 | 0.02 |
| 12 | Chlorobenzene | 9 | 8 | 6 | 74 | 25 | 172 | 0.01 |
| 13 | Mercury | 16 | 13 | 6 | 30 | 10 | 70 | 0.01 |
| 14 | Cadmium | 9 | 9 | 6 | 13 | 4 | 30 | 0.00 |
| 15 | Ethyl Chloride | 4 | 4 | 4 | 3 | 1 | 6 | 0.00 |
| 16 | Lead | 16 | 12 | 6 | 0 | 0 | 1 | 0.00 |
| 17 | Selenium | 5 | 5 | 5 | 0 | 0 | 0 | 0.00 |
| | | 18 | 14 | 6 | 511,850 | 170,617 | 1,194,318 | 100% |

3.13b. Releases by ICD Category

Musculoskeletal system and connective tissue diseases are subdivided into 7 major groups. Chemicals released by natural gas compressor stations in NYS are positively associated with 5 of them. It should be remembered, that a single chemical can be associated with more than one category of disease.

M00-M25: A single chemical released by 5 stations is associated with arthropathies, specifically, "Kashin-Beck disease".

M30-M36: Three chemicals released by all 18 sites are associated with systemic connective tissue disorders: undifferentiated connective tissue disease (UCTD) and connective tissue disease (CTD).

M60-M79: Twelve chemicals released by all 18 sites are associated with soft tissue disorders: muscle contractility, spasticity or weakness.

M80-M90: The heavy metal cadmium, released by 9 sites, is associated with osteopathies.

M95-M99: Three chemicals are associated with other disorders of the musculoskeletal system and connective tissue

Table 3.13a.

Diseases of the Musculoskeletal System and Connective Tissue by ICD Category

NYS Natural Gas Compressor Stations, 2008-2014

| ICD-10 | | | Facilities | | | | Chemicals | | | | Pounds | | | |
|--------|----------------|---|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|----------------|----------------|----------------|----------------|
| # | Description | | '08 | '11 | '14 | Tot | '08 | '11 | '14 | Tot | 2008 | 2011 | 2014 | Total |
| 1 | M00-M25 | Arthropathies | 4 | 4 | 3 | 5 | 1 | 1 | 1 | 1 | 0.0004 | 0.0017 | 0.0006 | 0.0027 |
| 2 | M30-M36 | Systemic connective tissue disorders | 18 | 18 | 15 | 18 | 3 | 3 | 3 | 3 | 94,984 | 226,319 | 165,482 | 486,785 |
| 3 | M40-M54 | Dorsopathies | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | M60-M79 | Soft tissue disorders | 18 | 17 | 14 | 18 | 12 | 12 | 12 | 12 | 7,236 | 15,111 | 11,804 | 34,152 |
| 5 | M80-M90 | Osteopathies | 9 | 5 | 4 | 9 | 1 | 1 | 1 | 1 | 8 | 0 | 4 | 13 |
| 6 | M91-M94 | Chondropathies | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7 | M95-M99 | Other disorders of the musculoskeletal system and connective tissue | 10 | 9 | 8 | 11 | 3 | 3 | 3 | 3 | 19 | 37 | 19 | 76 |
| | M00-M99 | Total | 18 | 18 | 15 | 18 | 17 | 17 | 17 | 17 | 100,200 | 237,557 | 174,092 | 511,850 |

3.13c. Releases by Facility

All natural gas compressor stations in NYS reported releases chemical associated with musculoskeletal system and connective tissue diseases.

The top 5 polluters were facilities operated by the Tennessee Gas Pipeline Company.

Tennessee Gas Pipeline Company Compressor Station 245, ranked first with 211,513 pounds or 17.2% of the state total, followed by Compressor Station 249 in Carlisle (196,907 pounds or 16%) and Compressor Station 229 in Eden (170,674 pounds or 13.8%). These three facilities were responsible for one-half of the state total.

The top 5 facilities were responsible for slightly less than two-thirds (65.1%) of all releases.

The facility average was 68,510 million pounds over 7 years or 9,787 each year.

Table 3.13c.

Diseases of the Musculoskeletal System and Connective Tissue by Facility (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Facility | | Location | | Chemicals | | | 7 Years (estimate) | | |
|----------|-----------------------|--------------------|------------|-----------|-----|-----|--------------------|-----------|-------|
| Rank | Facility Name (Short) | Town | County | '08 | '11 | '14 | Average | Tot. Lbs. | % |
| 1 | TGPC CS 245 | Winfield | Herkimer | 13 | 13 | 8 | 30,216 | 211,513 | 17.15 |
| 2 | TGPC CS 249 | Carlisle | Schoharie | 13 | 8 | 8 | 28,130 | 196,907 | 15.97 |
| 3 | TGPC 229 & TEG DF | Eden | Erie | 11 | 10 | 11 | 24,382 | 170,674 | 13.84 |
| 4 | TGPC CS 241 | LaFayette | Onondaga | 12 | 9 | 12 | 17,983 | 125,878 | 10.21 |
| 5 | TGPC CS 237 | Manchester, Phelps | Ontario | 2 | 1 | 0 | 13,956 | 97,690 | 7.92 |
| 6 | AGT SOUTHEAST CS | Southeast | Putnam | 9 | 6 | 12 | 11,741 | 82,189 | 6.66 |
| 7 | AGT Stony Point CS | Stony Point | Rockland | 14 | 8 | 10 | 11,115 | 77,803 | 6.31 |
| 8 | NFGSC Concord CS | Concord | Erie | 3 | 4 | 4 | 8,924 | 62,465 | 5.07 |
| 9 | TGPC CS 254 | Chatham | Columbia | 9 | 4 | 1 | 8,668 | 60,676 | 4.92 |
| 10 | DTI Woodhull Station | Woodhull | Steuben | 12 | 15 | 15 | 5,165 | 36,154 | 2.93 |
| 11 | NFGSC Beech Hill CS | Willing | Allegany | 9 | 9 | 10 | 4,093 | 28,650 | 2.32 |
| 12 | TGPC CS 224 | Clymer | Chautauqua | 13 | 12 | 13 | 3,494 | 24,460 | 1.98 |
| 13 | TGPC CS 230-C | Lockport | Niagara | 9 | 8 | 9 | 2,305 | 16,133 | 1.31 |
| 14 | TGPC CS 233 | York | Livingston | 9 | 4 | 0 | 1,802 | 12,614 | 1.02 |
| 15 | NFGSC Independence CS | Andover | Allegany | 7 | 2 | 8 | 1,363 | 9,540 | 0.77 |
| 16 | DTI Utica Station | Frankfort | Herkimer | 9 | 11 | 15 | 1,140 | 7,978 | 0.65 |
| 17 | NFGSC Nashville CS | Hanover | Chautauqua | 9 | 9 | 0 | 895 | 6,266 | 0.51 |
| 18 | DTI Borger CS | Ithaca | Tompkins | 12 | 12 | 8 | 798 | 5,584 | 0.45 |
| | | | | 17 | 17 | 17 | 176,168 | 1,233,174 | 100% |

3.13d. Releases by DEC Region

The 18 compressor stations analyzed are in 6 of New York State's 9 DEC regions. All 6 regions had releases of chemicals associated with musculoskeletal system and connective tissue diseases.

Region 9, Western New York ranked first with 316,000 pounds (25.7%), followed by Region 6, Western Adirondacks/Eastern Lake Ontario (219,490 pounds or 17.8%) and Region 4, Capital Region/Northern Catskills (257,583 or 21%).

Table 3.13d.

Diseases of the Musculoskeletal System and Connective Tissue by DEC Region (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| NYS DEC Region | | County | | 3 Years: 2008, 2011, 2014 | | | 7-Year Estimate: 2008-2014 | | |
|----------------|-----------------------------------|------------|------|---------------------------|------|--------------|----------------------------|--------------|-------|
| Rank | Number \ Name | Name | Rank | Fac's | Ch's | Total Pounds | Average Pounds | Total Pounds | % |
| 1 | 9: Western New York | Allegany | 9 | 2 | 10 | 16,367 | 5,456 | 38,191 | 3.10 |
| | | Chautauqua | 11 | 2 | 16 | 12,273 | 4,091 | 28,637 | 2.33 |
| | | Erie | 1 | 2 | 13 | 99,917 | 33,306 | 233,139 | 18.94 |
| | | Niagara | 12 | 1 | 9 | 6,914 | 2,305 | 16,133 | 1.31 |
| | | | | 7 | 17 | 135,472 | 45,157 | 316,100 | 25.68 |
| 2 | 6: W Adirondacks / E Lake Ontario | Herkimer | 2 | 2 | 16 | 94,067 | 31,356 | 219,490 | 17.83 |
| 3 | 4: Capital Region / N Catskills | Columbia | 8 | 1 | 9 | 26,004 | 8,668 | 60,676 | 4.93 |
| | | Schoharie | 3 | 1 | 13 | 84,389 | 28,130 | 196,907 | 15.99 |
| | | | | 2 | 15 | 110,393 | 36,798 | 257,583 | 20.92 |
| 6 | 3: Lower Hudson Valley | Putnam | 6 | 1 | 13 | 35,224 | 11,741 | 82,189 | 6.68 |
| | | Rockland | 7 | 1 | 14 | 33,344 | 11,115 | 77,803 | 6.32 |
| | | | | 2 | 16 | 68,568 | 22,856 | 159,992 | 13.00 |
| 4 | 7: Central New York | Onondaga | 4 | 1 | 12 | 53,948 | 17,983 | 125,878 | 10.22 |
| | | Tompkins | 14 | 1 | 12 | 2,393 | 798 | 5,584 | 0.45 |
| | | | | 2 | 17 | 56,341 | 18,780 | 131,462 | 10.68 |
| 5 | 8: Western Finger Lakes | Livingston | 13 | 1 | 9 | 3,604 | 1,802 | 12,614 | 1.02 |
| | | Ontario | 5 | 1 | 2 | 27,912 | 13,956 | 97,690 | 7.94 |
| | | Steuben | 10 | 1 | 16 | 15,495 | 5,165 | 36,154 | 2.94 |
| | | | | 3 | 16 | 47,010 | 20,923 | 146,459 | 11.90 |
| | | | | 18 | 17 | 511,850 | 175,869 | 1,231,086 | 100% |

3.13e. Releases by County

All 14 counties where compressor stations are located reported releases of chemicals linked to musculoskeletal system and connective tissue diseases.

Erie County ranked first with 233,139 pounds or 19% of the state total, followed by Herkimer County (219,490 pounds or 17.8%) and Schoharie County (196,906 pounds or 16%). These three counties are responsible for slightly more than one-half (53%) of all toxic releases.

The top five counties were responsible for 71%.

The country average was 87,934 pounds over a 7-year period or 12,562 pounds annually.

Table 3.13e.

Diseases of the Musculoskeletal System and Connective Tissue by County (ranked)

NYS Natural Gas Compressor Stations, 2008-2014

| Rank | County | NYS DEC Region | 3 Years: 2008, 2011, 2014 | | | 7-Year Estimate: 2008-2014 | | |
|------|------------|--|---------------------------|-----------|----------------|----------------------------|------------------|-------------|
| | | | Fac's | Ch's | Total Pounds | Average Pounds | Total Pounds | % |
| 1 | Erie | 9: Western New York | 2 | 13 | 99,916 | 33,305 | 233,139 | 18.94 |
| 2 | Herkimer | 6: Western Adirondacks/E. Lake Ontario | 2 | 16 | 94,067 | 31,355 | 219,490 | 17.83 |
| 3 | Schoharie | 4: Capital Region/Northern Catskills | 1 | 13 | 84,388 | 28,129 | 196,906 | 15.99 |
| 4 | Onondaga | 7: Central New York | 1 | 12 | 53,947 | 17,982 | 125,878 | 10.23 |
| 5 | Ontario | 8: Western Finger Lakes | 1 | 2 | 27,911 | 13,955 | 97,690 | 7.94 |
| 6 | Putnam | 3: Lower Hudson Valley | 1 | 13 | 35,223 | 11,741 | 82,188 | 6.68 |
| 7 | Rockland | 3: Lower Hudson Valley | 1 | 14 | 33,344 | 11,114 | 77,802 | 6.32 |
| 8 | Columbia | 4: Capital Region/Northern Catskills | 1 | 9 | 26,003 | 8,667 | 60,675 | 4.93 |
| 9 | Allegany | 9: Western New York | 2 | 10 | 16,367 | 5,455 | 38,190 | 3.10 |
| 10 | Steuben | 8: Western Finger Lakes | 1 | 16 | 15,494 | 5,164 | 36,154 | 2.94 |
| 11 | Chautauqua | 9: Western New York | 2 | 16 | 12,273 | 4,091 | 28,637 | 2.33 |
| 12 | Niagara | 9: Western New York | 1 | 9 | 6,914 | 2,304 | 16,133 | 1.31 |
| 13 | Livingston | 8: Western Finger Lakes | 1 | 9 | 3,604 | 1,802 | 12,614 | 1.02 |
| 14 | Tompkins | 7: Central New York | 1 | 12 | 2,393 | 797 | 5,583 | 0.45 |
| | | | 18 | 17 | 511,844 | 175,861 | 1,231,079 | 100% |

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3.14. Diseases of the Genitourinary System (N00-N99)

3.14a. Releases by Chemicals

Forty-three of the 70 chemicals released by NYS natural gas compressor stations are associated with diseases of the genitourinary system (ICD-10, Chapter 14).

Releases of genitourinary toxicants were reported by all 18 stations and totaled an estimated 39.7 million pounds from 2008 to 2014--an annual average of 5.7 million pounds.

Chemicals associated with genitourinary system diseases represented 99.4% of releases by the state's natural gas compressor stations.

Or, to put it differently, ***of the 40.2 million pounds of chemicals released by NYS's compressor stations, 98.9% had one or more effects on the genitourinary system.***

Nitrogen oxides ranked first with 18.1 million pounds or nearly one-half (45.5%) of the total, followed by carbon monoxide (12.4 million pounds or 31.1%) and volatile organic compounds (4.9 million pounds or 12.4%). These three chemicals accounted for 35.4 million pounds or 89% of all releases.

The top 10 chemicals accounted for 99.9% of the state total.

Table 3.14a.

Diseases of the Genitourinary System (Top 10 Chemicals by Pounds Released)

NYS Natural Gas Compressor Stations, 2008-2014

| Chemical | | Location | | | 3 Years | 7 Year Estimate: 2008 to 2014 | | |
|----------|-----------------------------|----------|------|-------|------------|-------------------------------|------------|-------|
| Rank | Name | Fac's | Cn's | Reg's | Pounds | Average | Pounds | % |
| 1 | Nitrogen Oxides | 18 | 14 | 6 | 7,749,673 | 2,583,224 | 18,082,571 | 45.50 |
| 2 | Carbon Monoxide | 18 | 14 | 6 | 5,297,028 | 1,765,676 | 12,359,731 | 31.10 |
| 3 | Volatile Organic Compounds | 18 | 14 | 6 | 2,108,741 | 702,914 | 4,920,396 | 12.38 |
| 4 | Formaldehyde | 18 | 14 | 6 | 561,144 | 187,048 | 1,309,336 | 3.29 |
| 5 | PM10 Primary (Filt + Cond) | 18 | 14 | 6 | 539,890 | 179,963 | 1,259,744 | 3.17 |
| 6 | PM2.5 Primary (Filt + Cond) | 18 | 14 | 6 | 474,085 | 158,028 | 1,106,198 | 2.78 |
| 7 | PM Condensable | 18 | 14 | 6 | 231,543 | 77,181 | 540,267 | 1.36 |
| 8 | Acetaldehyde | 14 | 13 | 6 | 28,272 | 9,424 | 65,969 | 0.17 |
| 9 | Benzene | 16 | 13 | 6 | 9,103 | 3,034 | 21,241 | 0.05 |
| 10 | Methanol | 8 | 7 | 6 | 8,286 | 2,762 | 19,333 | 0.05 |
| | | 18 | 14 | 6 | 17,007,765 | 5,669,255 | 39,684,785 | 99.86 |

3.14b. Releases by ICD Category

Genitourinary system diseases are subdivided into 2 major groups. Chemicals released by natural gas compressor stations in NYS are positively associated with both. It should be remembered, that a single chemical can be associated with more than one category of disease.

N00-N39: Diseases of the urinary system

Thirty-three chemicals are associated with diseases of the urinary system.

One chemical has been implicated in renal failure (N17-N19).

N25-N29: Thirty-two chemicals are associated with other disorders of kidney and ureter. Effects on kidneys include: changes in blood vessels or in circulation, permanent damage, depressed function, necrosis, stones, injury, lesions or weight change.

N30-N39: Six chemicals are associated with other diseases of urinary system, including damage to the Cowper's gland and bladder weight change.

N40-N99: Diseases of the pelvis, genitals and breasts

Thirty-seven chemicals are associated with diseases of the pelvis, genitals and breasts that effect reproduction.

Twenty-two chemicals are associated with diseases of male genital organs (N40-N51), including: epididymis, low hormone levels, male impotence, reduced fertility, semen (chemical contamination of semen, low amount of semen and low number of swimming semen), seminal vesicle injury, sperm (abnormalities, irregular shape and low number), and sterility.

A single chemical has been implicated in inflammatory diseases of female pelvic organs (N70-N77).

Nineteen have been connected to noninflammatory disorders of female genital tract (N80-N98): both primary infertility (infertility without any previous pregnancy) and secondary infertility (fertility problems occurring in a couple that has conceived on their own and had a child in the past), cervical erosion, effects on the ovaries (damage, weight changes and unspecified effects), menstrual problems including dysmenorrhea, endometrial stromal polyps, and vagina effects.

Table 3.14b

Diseases of the Genitourinary System by ICD Code Group

NYS Natural Gas Compressor Stations, 2008-2014

| ICD-10 | | | Facilities | | | | Chemicals | | | | Pounds | | | |
|--------|----------------|--|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------------|------------------|------------------|-------------------|
| # | Description | | '08 | '11 | '14 | Tot | '08 | '11 | '14 | Tot | 2008 | 2011 | 2014 | Total |
| 1 | N00-N39 | Diseases of the genitourinary system: urinary system | 18 | 18 | 17 | 18 | 33 | 33 | 33 | 33 | 495,206 | 1,091,088 | 1,143,810 | 2,730,105 |
| 1.1 | N00-N08 | Glomerular diseases | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.2 | N10-N16 | Renal tubulo-interstitial diseases | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.3 | N17-N19 | Renal failure | 6 | 7 | 8 | 8 | 1 | 1 | 1 | 1 | 1,381 | 4,324 | 2,580 | 8,285 |
| 1.4 | N20-N23 | Urolithiasis | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.5 | N25-N29 | Other disorders of kidney and ureter | 18 | 18 | 17 | 18 | 32 | 32 | 32 | 32 | 494,933 | 1,090,089 | 1,143,059 | 2,728,082 |
| 1.6 | N30-N39 | Other diseases of urinary system | 18 | 17 | 16 | 18 | 6 | 6 | 6 | 6 | 112,062 | 235,167 | 225,555 | 572,785 |
| 2 | N40-N99 | Diseases of the genitourinary system: pelvis, genitals and breasts | 18 | 18 | 17 | 18 | 36 | 37 | 37 | 37 | 4,426,090 | 6,690,914 | 5,913,394 | 17,030,399 |
| 2.1 | N40-N51 | Diseases of male genital organs | 18 | 18 | 17 | 18 | 22 | 22 | 22 | 22 | 1,533,660 | 2,275,644 | 2,083,319 | 5,892,625 |
| 2.2 | N60-N64 | Disorders of breast | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.3 | N70-N77 | Inflammatory diseases of female pelvic organs | 18 | 17 | 16 | 18 | 1 | 1 | 1 | 1 | 110,333 | 229,882 | 220,927 | 561,143 |
| 2.4 | N80-N98 | Noninflammatory disorders of female genital tract | 18 | 18 | 17 | 18 | 19 | 19 | 19 | 19 | 738,279 | 1,664,712 | 1,573,589 | 3,976,581 |
| 2.5 | N99 | Other disorders of genitourinary tract | 18 | 18 | 17 | 18 | 29 | 30 | 30 | 30 | 1,733,463 | 2,737,002 | 2,433,354 | 6,903,820 |
| | N00-N99 | Total | 18 | 18 | 17 | 18 | 42 | 43 | 43 | 43 | 4,426,468 | 6,691,459 | 5,913,756 | 17,031,684 |

3.14c. Releases by Facility

All natural gas compressor stations in NYS reported releases chemical associated with genitourinary system diseases.

The top 6 polluters were facilities operated by the Tennessee Gas Pipeline Company.

Tennessee Gas Pipeline Company Compressor Station 245, ranked first with 10.4 pounds, more than one-half (26.1%) of the state total, followed by Compressor Station 229 in Eden (5.1 million or 12.7%) and Compressor Station 249 in Carlisle (4.3 pounds or 10.8%). In aggregate, these three facilities were responsible for 19.8 million pounds or slightly less than one-half (49.6%) of the state total.

The top 5 facilities were responsible for 25.2 million pounds, slightly less than two-thirds (63.1%) of all releases.

The facility average was 2.2 million pounds over 7 years or 317,048 pounds each year.

Table 3.14c.

Diseases of the Genitourinary System by Facility (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Facility | | Location | | Chemicals | | | 7 Years (estimate) | | |
|----------|-----------------------|--------------------|------------|-----------|-----|-----|--------------------|------------|-------|
| Rank | Facility Name (Short) | Town | County | '08 | '11 | '14 | Average | Tot. Lbs. | % |
| 1 | TGPC CS 245 | Winfield | Herkimer | 34 | 34 | 22 | 1,491,035 | 10,437,248 | 26.13 |
| 2 | TGPC 229 & TEG DF | Eden | Erie | 31 | 30 | 31 | 727,142 | 5,089,991 | 12.74 |
| 3 | TGPC CS 249 | Carlisle | Schoharie | 34 | 23 | 23 | 613,568 | 4,294,974 | 10.75 |
| 4 | TGPC CS 241 | LaFayette | Onondaga | 33 | 24 | 33 | 430,379 | 3,012,652 | 7.54 |
| 5 | TGPC CS 254 | Chatham | Columbia | 21 | 14 | 8 | 340,832 | 2,385,827 | 5.97 |
| 6 | TGPC CS 237 | Manchester, Phelps | Ontario | 8 | 7 | 4 | 328,157 | 2,297,097 | 5.75 |
| 7 | AGT Stony Point CS | Stony Point | Rockland | 36 | 19 | 20 | 282,892 | 1,980,244 | 4.96 |
| 8 | NFGSC Concord CS | Concord | Erie | 10 | 9 | 11 | 247,433 | 1,732,032 | 4.34 |
| 9 | AGT SOUTHEAST CS | Southeast | Putnam | 21 | 16 | 26 | 236,452 | 1,655,166 | 4.14 |
| 10 | NFGSC Beech Hill CS | Willing | Allegany | 18 | 18 | 19 | 197,907 | 1,385,347 | 3.47 |
| 11 | NFGSC Independence CS | Andover | Allegany | 14 | 9 | 16 | 193,316 | 1,353,211 | 3.39 |
| 12 | TGPC CS 224 | Clymer | Chautauqua | 34 | 32 | 34 | 162,635 | 1,138,443 | 2.85 |
| 13 | DTI Woodhull Station | Woodhull | Steuben | 25 | 34 | 38 | 117,138 | 819,966 | 2.05 |
| 14 | DTI Borger CS | Ithaca | Tompkins | 25 | 26 | 17 | 110,760 | 775,319 | 1.94 |
| 15 | NFGSC Nashville CS | Hanover | Chautauqua | 20 | 20 | 0 | 88,900 | 622,297 | 1.56 |
| 16 | TGPC CS 230-C | Lockport | Niagara | 21 | 20 | 21 | 66,406 | 464,840 | 1.16 |
| 17 | DTI Utica Station | Frankfort | Herkimer | 20 | 24 | 37 | 39,872 | 279,102 | 0.70 |
| 18 | TGPC CS 233 | York | Livingston | 21 | 14 | 3 | 32,039 | 224,273 | 0.56 |
| | | | | 42 | 43 | 43 | 5,706,861 | 39,948,030 | 100% |

3.14d. Releases by DEC Region

The 18 compressor stations analyzed are in 6 of New York State's 9 DEC regions. All 6 regions had releases of chemicals associated with genitourinary system diseases.

Region 9, Western New York ranked first with 2.7 million pounds (29.1%), closely followed by Region 6, Western Adirondacks/Eastern Lake Ontario (10.7 million pounds or 27%). Region 4, Capital Region/Northern Catskills, ranked third with 6.7 million pounds (16.8%).

Table 3.14d.

Diseases of the Genitourinary System by DEC Region (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| NYS DEC Region | | County | | 3 Years: 2008, 2011, 2014 | | | 7-Year Estimate: 2008-2014 | | |
|----------------|-----------------------------------|------------|------|---------------------------|------|--------------|----------------------------|--------------|-------|
| Rank | Number \ Name | Name | Rank | Fac's | Ch's | Total Pounds | Average Pounds | Total Pounds | % |
| 1 | 9: Western New York | Allegany | 5 | 2 | 20 | 1,173,668 | 391,223 | 2,738,558 | 6.89 |
| | | Chautauqua | 10 | 2 | 41 | 665,703 | 221,901 | 1,553,307 | 3.91 |
| | | Erie | 2 | 2 | 34 | 2,923,724 | 974,575 | 6,822,023 | 17.17 |
| | | Niagara | 13 | 1 | 21 | 199,217 | 66,406 | 464,840 | 1.17 |
| | | | | 7 | 42 | 4,962,312 | 1,654,104 | 11,578,729 | 29.14 |
| 2 | 6: W Adirondacks / E Lake Ontario | Herkimer | 1 | 2 | 42 | 4,592,722 | 1,530,907 | 10,716,351 | 26.97 |
| 3 | 4: Capital Region / N Catskills | Columbia | 6 | 1 | 21 | 1,022,497 | 340,832 | 2,385,827 | 6.00 |
| | | Schoharie | 3 | 1 | 34 | 1,840,703 | 613,568 | 4,294,974 | 10.81 |
| | | | | 2 | 38 | 2,863,201 | 954,400 | 6,680,801 | 16.81 |
| 4 | 7: Central New York | Onondaga | 4 | 1 | 33 | 1,291,137 | 430,379 | 3,012,652 | 7.58 |
| | | Tompkins | 12 | 1 | 26 | 332,279 | 110,760 | 775,319 | 1.95 |
| | | | | 2 | 43 | 1,623,416 | 541,139 | 3,787,971 | 9.53 |
| 6 | 3: Lower Hudson Valley | Putnam | 9 | 1 | 28 | 709,357 | 236,452 | 1,655,166 | 4.16 |
| | | Rockland | 8 | 1 | 36 | 848,676 | 282,892 | 1,980,244 | 4.98 |
| | | | | 2 | 40 | 1,558,033 | 519,344 | 3,635,410 | 9.15 |
| 5 | 8: Western Finger Lakes | Livingston | 14 | 1 | 21 | 96,117 | 32,039 | 224,273 | 0.56 |
| | | Ontario | 7 | 1 | 8 | 984,470 | 328,157 | 2,297,097 | 5.78 |
| | | Steuben | 11 | 1 | 39 | 351,414 | 117,138 | 819,966 | 2.06 |
| | | | | 3 | 39 | 1,432,001 | 477,334 | 3,341,336 | 8.41 |
| | | | | 18 | 43 | 17,031,685 | 5,677,228 | 39,740,598 | 100% |

3.14e. Releases by County

All 14 counties where compressor stations are located reported releases of chemicals linked to genitourinary system diseases.

Herkimer County ranked first with 10.7 million pounds, more than one-quarter (27%) of the state total, followed by Erie County (6.8 million pounds or 17.2%) and Schoharie County (4.3 million pounds or 10.8%). These three counties are responsible for slightly more than one-half (53%) of all toxic releases.

The top five counties were responsible for 21.8 million pounds or more than one-half (55%) of the state total.

The country average was 2.8 million pounds over a 7-year period or 405,516 pounds annually.

Table 3.14e.

Diseases of the Genitourinary System by County (ranked)

NYS Natural Gas Compressor Stations, 2008-2014

| Rank | County | NYS DEC Region | 3 Years: 2008, 2011, 2014 | | | 7-Year Estimate: 2008-2014 | | |
|------|------------|--|---------------------------|-----------|-------------------|----------------------------|-------------------|-------------|
| | | | Fac's | Ch's | Total Pounds | Average Pounds | Total Pounds | % |
| 1 | Herkimer | 6: Western Adirondacks/E. Lake Ontario | 2 | 42 | 4,592,722 | 1,530,907 | 10,716,350 | 26.97 |
| 2 | Erie | 9: Western New York | 2 | 34 | 2,923,724 | 974,575 | 6,822,022 | 17.17 |
| 3 | Schoharie | 4: Capital Region/Northern Catskills | 1 | 34 | 1,840,703 | 613,568 | 4,294,974 | 10.81 |
| 4 | Onondaga | 7: Central New York | 1 | 33 | 1,291,137 | 430,379 | 3,012,651 | 7.58 |
| 5 | Allegany | 9: Western New York | 2 | 20 | 1,173,668 | 391,223 | 2,738,558 | 6.89 |
| 6 | Columbia | 4: Capital Region/Northern Catskills | 1 | 21 | 1,022,497 | 340,832 | 2,385,826 | 6.00 |
| 7 | Ontario | 8: Western Finger Lakes | 1 | 8 | 984,470 | 328,157 | 2,297,097 | 5.78 |
| 8 | Rockland | 3: Lower Hudson Valley | 1 | 36 | 848,676 | 282,892 | 1,980,244 | 4.98 |
| 9 | Putnam | 3: Lower Hudson Valley | 1 | 28 | 709,357 | 236,452 | 1,655,165 | 4.16 |
| 10 | Chautauqua | 9: Western New York | 2 | 41 | 665,703 | 221,901 | 1,553,307 | 3.91 |
| 11 | Steuben | 8: Western Finger Lakes | 1 | 39 | 351,414 | 117,138 | 819,966 | 2.06 |
| 12 | Tompkins | 7: Central New York | 1 | 26 | 332,279 | 110,760 | 775,318 | 1.95 |
| 13 | Niagara | 9: Western New York | 1 | 21 | 199,217 | 66,406 | 464,840 | 1.17 |
| 14 | Livingston | 8: Western Finger Lakes | 1 | 21 | 96,117 | 32,039 | 224,272 | 0.56 |
| | | | 18 | 43 | 17,031,685 | 5,677,228 | 39,740,590 | 100% |

3.15. Pregnancy, Childbirth and the Puerperium (O00-O99)

3.15a. Releases by Chemical

Eighteen of the 70 chemicals released by NYS natural gas compressor stations are associated with diseases of pregnancy, childbirth and the puerperium (ICD-10, Chapter 15).

Releases of these toxicants were reported by all 18 stations and totaled an estimated 19.5 million pounds from 2008 to 2014--an annual average of 2.8 million pounds.

Chemicals associated with diseases of pregnancy, childbirth and the puerperium represented 48.8% of releases by the state's natural gas compressor stations.

Or, to put it differently, ***of the 40.2 million pounds of chemicals released by NYS's compressor stations, slightly less than one-half (48.62%) had adverse effects on pregnancy, childbirth and the puerperium.***

Nitrogen oxides ranked first with 18.1 million pounds or (92.5%) of the total. Formaldehyde was a distant second (1.3 million pounds or 6.7%), followed by acetaldehyde (65,969 pounds or 0.34%).

These two chemicals accounted for 19.4 million pounds or 99.2% of all releases.

Table 3.15a.

Pregnancy, Childbirth and the Puerperium by Chemical (ranked)

NYS Natural Gas Compressor Stations, 2008-2014

| Chemical | | Location | | | 3 Years | 7 Year Estimate: 2008 to 2014 | | |
|----------|-------------------------|----------|------|-------|-----------|-------------------------------|------------|-------|
| Rank | Name | Fac's | Cn's | Reg's | Pounds | Average | Pounds | % |
| 1 | Nitrogen Oxides | 18 | 14 | 6 | 7,749,673 | 2,583,224 | 18,082,571 | 92.54 |
| 2 | Formaldehyde | 18 | 14 | 6 | 561,144 | 187,048 | 1,309,336 | 6.70 |
| 3 | Acetaldehyde | 14 | 13 | 6 | 28,272 | 9,424 | 65,969 | 0.34 |
| 4 | Acrolein | 14 | 13 | 6 | 22,596 | 7,532 | 52,723 | 0.27 |
| 5 | Toluene | 16 | 13 | 6 | 8,275 | 2,758 | 19,308 | 0.10 |
| 6 | Xylenes (Mixed Isomers) | 15 | 13 | 6 | 3,598 | 1,199 | 8,394 | 0.04 |
| 7 | Naphthalene | 15 | 13 | 6 | 298 | 99 | 696 | 0.00 |
| 8 | Methylene Chloride | 8 | 7 | 6 | 269 | 90 | 629 | 0.00 |
| 9 | Ethylene Dibromide | 8 | 7 | 6 | 149 | 50 | 347 | 0.00 |
| 10 | Carbon Tetrachloride | 8 | 7 | 6 | 121 | 40 | 282 | 0.00 |
| 11 | Styrene | 8 | 7 | 6 | 100 | 33 | 234 | 0.00 |
| 12 | Ethylene Dichloride | 6 | 6 | 5 | 65 | 22 | 151 | 0.00 |
| 13 | Vinyl Chloride | 8 | 7 | 6 | 46 | 15 | 107 | 0.00 |
| 14 | Mercury | 16 | 13 | 6 | 30 | 10 | 70 | 0.00 |
| 15 | Cadmium | 9 | 9 | 6 | 13 | 4 | 30 | 0.00 |
| 16 | Tetrachloroethylene | 4 | 4 | 4 | 4 | 1 | 9 | 0.00 |
| 17 | Lead | 16 | 12 | 6 | 0 | 0 | 1 | 0.00 |
| 18 | Arsenic | 6 | 6 | 5 | 0 | 0 | 0.1 | 0.00 |
| | | 18 | 14 | 6 | 8,374,652 | 2,791,551 | 19,540,856 | 100% |

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3.15b. Releases by ICD Category

Diseases of pregnancy, childbirth and the puerperium are subdivided into 8 major groups. Chemicals released by natural gas compressor stations in NYS are positively associated with three. It should be remembered, that a single chemical can be associated with more than one category of disease.

O00-O08: Fourteen chemicals, released by all 18 sites, are associated with pregnancy with abortive outcome.

O30-O48: Five chemicals are associated with maternal care related to the fetus and amniotic cavity and possible delivery problems.

O85-O92: A single chemicals is implicated in complications predominantly related to the puerperium.

Table 3.15b.

Pregnancy, Childbirth and the Puerperium by ICD Code Group

NYS Natural Gas Compressor Stations, 2008-2014

| ICD-10 | | | Facilities | | | | Chemicals | | | | Pounds | | | |
|--------|----------------|---|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------------|------------------|------------------|------------------|
| # | Description | | '08 | '11 | '14 | Tot | '08 | '11 | '14 | Tot | 2008 | 2011 | 2014 | Total |
| 1 | O00-O08 | Pregnancy with abortive outcome | 18 | 18 | 17 | 18 | 14 | 14 | 14 | 14 | 2,389,023 | 3,255,109 | 2,729,996 | 8,374,129 |
| 2 | O10-O16 | Edema, proteinuria and hypertensive disorders in pregnancy, childbirth and the puerperium | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 | O20-O29 | Other maternal disorders predominantly related to pregnancy | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | O30-O48 | Maternal care related to the fetus and amniotic cavity and possible delivery problems | 15 | 15 | 12 | 15 | 5 | 5 | 5 | 5 | 4,477 | 15,355 | 8,962 | 28,795 |
| 5 | O60-O75 | Complications of labor and delivery | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | O80-O84 | Delivery | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7 | O85-O92 | Complications predominantly related to the puerperium | 18 | 17 | 16 | 18 | 1 | 1 | 1 | 1 | 110,333 | 229,882 | 220,927 | 561,143 |
| 8 | O95-O99 | Other obstetric conditions, not elsewhere classified | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | O00-O99 | Total | 18 | 18 | 17 | 18 | 18 | 18 | 18 | 18 | 2,389,116 | 3,255,374 | 2,730,161 | 8,374,652 |

3.15c. Releases by Facility

All natural gas compressor stations in NYS reported chemical releases associated with pregnancy, childbirth and the puerperium diseases.

The top 4 polluters were facilities operated by the Tennessee Gas Pipeline Company.

Tennessee Gas Pipeline Company Compressor Station 245, ranked first with 6.1 pounds (30.9%), followed by Compressor Station 229 in Eden (3.3 million or 16.9%) and Compressor Station 249 in Carlisle (1.9 million pounds or 9.5%). In aggregate, these three facilities were responsible for 11.2 million pounds, more than one-half (57.3%) of the state total.

The top 5 facilities were responsible for 13.4 million pounds, slightly more than two-thirds (68.4%) of all releases.

The facility average was 1.1 million pounds over 7 years or 155,768 pounds each year.

Table 3.15c.

Pregnancy, Childbirth and the Puerperium by Facility (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Facility | | Location | | Chemicals | | | 7 Years (estimate) | | |
|----------|-----------------------|--------------------|------------|-----------|-----|-----|--------------------|------------|-------|
| Rank | Facility Name (Short) | Town | County | '08 | '11 | '14 | Average | Tot. Lbs. | % |
| 1 | TGPC CS 245 | Winfield | Herkimer | 16 | 16 | 10 | 865,884 | 6,061,190 | 30.88 |
| 2 | TGPC 229 & TEG DF | Eden | Erie | 14 | 13 | 14 | 473,307 | 3,313,147 | 16.88 |
| 3 | TGPC CS 249 | Carlisle | Schoharie | 16 | 10 | 10 | 267,623 | 1,873,364 | 9.54 |
| 4 | TGPC CS 254 | Chatham | Columbia | 10 | 7 | 2 | 162,679 | 1,138,751 | 5.80 |
| 5 | AGT SOUTHEAST CS | Southeast | Putnam | 10 | 7 | 11 | 148,254 | 1,037,778 | 5.29 |
| 6 | TGPC CS 241 | LaFayette | Onondaga | 15 | 11 | 15 | 132,651 | 928,556 | 4.73 |
| 7 | TGPC CS 237 | Manchester, Phelps | Ontario | 3 | 2 | 2 | 123,343 | 863,403 | 4.40 |
| 8 | AGT Stony Point CS | Stony Point | Rockland | 16 | 8 | 9 | 117,278 | 820,945 | 4.18 |
| 9 | NFGSC Concord CS | Concord | Erie | 4 | 3 | 4 | 109,935 | 769,544 | 3.92 |
| 10 | DTI Borger CS | Ithaca | Tompkins | 11 | 11 | 8 | 86,398 | 604,785 | 3.08 |
| 11 | TGPC CS 224 | Clymer | Chautauqua | 16 | 14 | 16 | 63,140 | 441,983 | 2.25 |
| 12 | NFGSC Beech Hill CS | Willing | Allegany | 9 | 9 | 9 | 53,918 | 377,423 | 1.92 |
| 13 | NFGSC Independence CS | Andover | Allegany | 6 | 3 | 6 | 51,476 | 360,334 | 1.84 |
| 14 | TGPC CS 230-C | Lockport | Niagara | 10 | 9 | 10 | 38,680 | 270,758 | 1.38 |
| 15 | NFGSC Nashville CS | Hanover | Chautauqua | 8 | 8 | 0 | 36,799 | 257,594 | 1.31 |
| 16 | DTI Woodhull Station | Woodhull | Steuben | 11 | 15 | 16 | 31,911 | 223,376 | 1.14 |
| 17 | TGPC CS 233 | York | Livingston | 10 | 7 | 1 | 22,714 | 158,999 | 0.81 |
| 18 | DTI Utica Station | Frankfort | Herkimer | 8 | 11 | 16 | 17,827 | 124,788 | 0.64 |
| | | | | 18 | 18 | 18 | 2,803,817 | 19,626,720 | 100% |

3.15d. Releases by DEC Regions

The 18 compressor stations analyzed are in 6 of New York State's 9 DEC regions. All 6 regions had releases of chemicals associated with pregnancy, childbirth and the puerperium diseases.

Region 6, Western Adirondacks/Eastern Lake Ontario, ranked first with 6.2 million pounds, nearly one-half (46.3%) of the state total, closely followed by Region 9, Western New York (5.7 million pounds or 43.7%). Region 4, Capital Region/Northern Catskills, ranked third with 3 million pounds (14%).

Table 3.15d.

Pregnancy, Childbirth and the Puerperium by DEC Region (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| NYS DEC Region | | County | | 3 Years: 2008, 2011, 2014 | | | 7-Year Estimate: 2008-2014 | | |
|----------------|-----------------------------------|------------|------|---------------------------|------|--------------|----------------------------|--------------|-------|
| Rank | Number \ Name | Name | Rank | Fac's | Ch's | Total Pounds | Average Pounds | Total Pounds | % |
| 1 | 6: W Adirondacks / E Lake Ontario | Herkimer | 1 | 2 | 18 | 2,651,134 | 883,711 | 6,185,978 | 46.32 |
| 2 | 9: Western New York | Allegany | 9 | 2 | 9 | 316,181 | 105,394 | 737,756 | 5.52 |
| | | Chautauqua | 10 | 2 | 18 | 263,020 | 87,673 | 613,712 | 4.60 |
| | | Erie | 2 | 2 | 15 | 1,749,724 | 583,241 | 4,082,690 | 30.57 |
| | | Niagara | 12 | 1 | 10 | 116,039 | 38,680 | 270,758 | 2.03 |
| | | | | 7 | 18 | 2,444,965 | 814,988 | 5,704,917 | 42.72 |
| 3 | 4: Capital Region / N Catskills | Columbia | 4 | 1 | 10 | 488,036 | 162,679 | 1,138,751 | 8.53 |
| | | Schoharie | 3 | 1 | 16 | 802,870 | 267,623 | 1,873,364 | 14.03 |
| | | | | 2 | 17 | 1,290,907 | 430,302 | 3,012,116 | 22.55 |
| 4 | 3: Lower Hudson Valley | Putnam | 5 | 1 | 11 | 444,762 | 148,254 | 1,037,778 | 7.77 |
| | | Rockland | 8 | 1 | 16 | 351,834 | 117,278 | 820,945 | 6.15 |
| | | | | 2 | 17 | 796,596 | 265,532 | 1,858,724 | 13.92 |
| 4 | 7: Central New York | Onondaga | 6 | 1 | 15 | 397,953 | 132,651 | 928,556 | 6.95 |
| | | Tompkins | 11 | 1 | 11 | 259,194 | 86,398 | 604,785 | 4.53 |
| | | | | 2 | 18 | 657,146 | 219,049 | 1,533,342 | 11.48 |
| 5 | 8: Western Finger Lakes | Livingston | 14 | 1 | 10 | 68,143 | 22,714 | 158,999 | 1.19 |
| | | Ontario | 7 | 1 | 3 | 370,030 | 123,343 | 863,403 | 6.47 |
| | | Steuben | 13 | 1 | 16 | 95,733 | 31,911 | 223,376 | 1.67 |
| | | | | 3 | 18 | 533,905 | 177,968 | 1,245,779 | 9.33 |
| | | | | 16 | 18 | 5,723,519 | 1,907,840 | 13,354,877 | 100% |

3.15e. Releases by County

All 14 counties where compressor stations are located reported releases of chemicals linked to genitourinary system diseases.

Herkimer County ranked first with 6.2 million pounds, slightly less than one-third (31.7%) of the state total, followed by Erie County (4.1 million pounds or 20.9%) and Schoharie County (1.9 million pounds or 9.6%). These three counties are responsible for 12.1 million pounds (62.1%) of all toxic releases.

The top five counties were responsible for 14.3 million pounds or nearly three-fourths (73.3%) of the state total.

The country average was 1.4 million pounds over a 7-year period or 199,396 pounds annually.

Table 3.15e.

Pregnancy, Childbirth and the Puerperium by County (ranked)

NYS Natural Gas Compressor Stations, 2008-2014

| Rank | County | NYS DEC Region | 3 Years: 2008, 2011, 2014 | | | 7-Year Estimate: 2008-2014 | | |
|------|------------|--|---------------------------|-----------|------------------|----------------------------|-------------------|-------------|
| | | | Fac's | Ch's | Total Pounds | Average Pounds | Total Pounds | % |
| 1 | Herkimer | 6: Western Adirondacks/E. Lake Ontario | 2 | 18 | 2,651,134 | 883,711 | 6,185,978 | 31.66 |
| 2 | Erie | 9: Western New York | 2 | 15 | 1,749,724 | 583,241 | 4,082,690 | 20.89 |
| 3 | Schoharie | 4: Capital Region/Northern Catskills | 1 | 16 | 802,870 | 267,623 | 1,873,364 | 9.59 |
| 4 | Columbia | 4: Capital Region/Northern Catskills | 1 | 10 | 488,036 | 162,679 | 1,138,751 | 5.83 |
| 5 | Putnam | 3: Lower Hudson Valley | 1 | 11 | 444,762 | 148,254 | 1,037,778 | 5.31 |
| 6 | Onondaga | 7: Central New York | 1 | 15 | 397,953 | 132,651 | 928,556 | 4.75 |
| 7 | Ontario | 8: Western Finger Lakes | 1 | 3 | 370,030 | 123,343 | 863,403 | 4.42 |
| 8 | Rockland | 3: Lower Hudson Valley | 1 | 16 | 351,834 | 117,278 | 820,945 | 4.20 |
| 9 | Allegany | 9: Western New York | 2 | 9 | 316,181 | 105,394 | 737,756 | 3.78 |
| 10 | Chautauqua | 9: Western New York | 2 | 18 | 263,020 | 87,673 | 613,712 | 3.14 |
| 11 | Tompkins | 7: Central New York | 1 | 11 | 259,194 | 86,398 | 604,785 | 3.09 |
| 12 | Niagara | 9: Western New York | 1 | 10 | 116,039 | 38,680 | 270,758 | 1.39 |
| 13 | Steuben | 8: Western Finger Lakes | 1 | 16 | 95,733 | 31,911 | 223,376 | 1.14 |
| 14 | Livingston | 8: Western Finger Lakes | 1 | 10 | 68,143 | 22,714 | 158,999 | 0.81 |
| | | | 18 | 18 | 8,374,652 | 2,791,551 | 19,540,856 | 100% |

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3.16. Certain Conditions Originating in the Perinatal Period (P00-P96)

3.16a. Releases by Chemical

Twenty of the 70 chemicals released by NYS natural gas compressor stations are associated with Certain Conditions Originating in the Perinatal Period (ICD-10, Chapter 16).

Releases of these toxicants were reported by all 18 stations and totaled an estimated 22.4 million pounds from 2008 to 2014--an annual average of 3.2 million pounds.

Or, to put it differently, ***of the 40.2 million pounds of chemicals released by NYS's compressor stations, 56% have been associated with certain conditions originating in the perinatal period.***

Nitrogen oxides ranked first with 18.1 million pounds, more than three-fourths (80.7%) of the total. Formaldehyde was a distant second (1,309,336 pounds or 5.8%), followed by PM 10 (1,259,744 million pounds or 3.8%). These three chemicals accounted for 19.4 million pounds or 92% of all releases.

The top 10 chemicals were responsible for virtually all releases (99.5%).

The annual average release was 3.2 million pounds.

Table 3.16a.

Certain Conditions Originating in the Perinatal Period by Chemical (ranked)

NYS Natural Gas Compressor Stations, 2008-2014

| Chemical | | Location | | | 3 Years | 7 Year Estimate: 2008 to 2014 | | |
|----------|-----------------------------|----------|------|-------|-----------|-------------------------------|------------|-------|
| Rank | Name | Fac's | Cn's | Reg's | Pounds | Average | Pounds | % |
| 1 | Nitrogen Oxides | 18 | 14 | 6 | 7,749,673 | 2,583,224 | 18,082,571 | 80.67 |
| 2 | Formaldehyde | 18 | 14 | 6 | 561,144 | 187,048 | 1,309,336 | 5.84 |
| 3 | PM10 Primary (Filt + Cond) | 18 | 14 | 6 | 539,890 | 179,963 | 1,259,744 | 5.62 |
| 4 | PM2.5 Primary (Filt + Cond) | 18 | 14 | 6 | 474,085 | 158,028 | 1,106,198 | 4.93 |
| 5 | PM Condensible | 18 | 14 | 6 | 231,543 | 77,181 | 540,267 | 2.41 |
| 6 | Acetaldehyde | 14 | 13 | 6 | 28,272 | 9,424 | 65,969 | 0.29 |
| 7 | Benzene | 16 | 13 | 6 | 9,103 | 3,034 | 21,241 | 0.09 |
| 8 | Toluene | 16 | 13 | 6 | 8,275 | 2,758 | 19,308 | 0.09 |
| 9 | Xylenes (Mixed Isomers) | 15 | 13 | 6 | 3,598 | 1,199 | 8,394 | 0.04 |
| 10 | Phenol | 11 | 10 | 6 | 303 | 101 | 706 | 0.00 |
| | | | | | 9,605,886 | 3,201,962 | 22,413,733 | 99.99 |
| 11 | Nickel | 11 | 11 | 6 | 296 | 99 | 692 | 0.00 |
| 12 | Manganese | 9 | 9 | 6 | 150 | 50 | 350 | 0.00 |
| 13 | Carbon Tetrachloride | 8 | 7 | 6 | 121 | 40 | 282 | 0.00 |
| 14 | Styrene | 8 | 7 | 6 | 100 | 33 | 234 | 0.00 |
| 15 | Chloroform | 9 | 8 | 6 | 83 | 28 | 193 | 0.00 |
| 16 | Phenanthrene | 11 | 9 | 6 | 21 | 7 | 48 | 0.00 |
| 17 | Cadmium | 9 | 9 | 6 | 13 | 4 | 30 | 0.00 |
| 18 | Acenaphthene | 10 | 8 | 6 | 4 | 1 | 8.3 | 0.00 |
| 19 | Lead | 16 | 12 | 6 | 0 | 0 | 1 | 0.00 |
| 20 | Arsenic | 6 | 6 | 5 | 0 | 0 | 0 | 0.00 |
| | | | | | 788 | 263 | 1,838 | 0.01 |
| | | | | | 9,606,673 | 3,202,224 | 22,415,571 | 100% |

3.16b. Releases by ICD Category

Certain Conditions Originating in the Perinatal Period are subdivided into 10 major groups. Chemicals released by natural gas compressor stations in NYS are positively associated with three. It should be remembered, that a single chemical can be associated with more than one category of disease.

P05-P08: Twenty-one chemicals are associated with disorders related to length of gestation and fetal growth: birth weight (low or extremely low), growth statistics (e.g., reduced weight gain), preterm birth, and small for gestational age.

P50-P61: A single chemical has been connected to hemorrhagic and hematological disorders of fetus and newborn.

Table 3.16b.

Certain Conditions Originating in the Perinatal Period by ICD Code Group

NYS Natural Gas Compressor Stations, 2008-2014

| ICD-10 | | | Facilities | | | | Chemicals | | | | Pounds | | | |
|--------|--|--|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------------|------------------|------------------|------------------|
| # | Description | | '08 | '11 | '14 | Tot | '08 | '11 | '14 | Tot | 2008 | 2011 | 2014 | Total |
| 1 | P00-P04 Fetus and newborn affected by maternal factors and by complications of pregnancy, labor and delivery | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 | P05-P08 Disorders related to length of gestation and fetal growth | | 18 | 18 | 17 | 18 | 19 | 19 | 19 | 19 | 2,631,857 | 3,820,078 | 3,154,716 | 9,606,652 |
| 3 | P10-P15 Birth trauma | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | P20-P29 Respiratory and cardiovascular disorders specific to the perinatal period | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | P35-P39 Infections specific to the perinatal period | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | P50-P61 Hemorrhagic and hematological disorders of fetus and newborn | | 10 | 8 | 6 | 11 | 1 | 1 | 1 | 1 | 3 | 14 | 2 | 20 |
| 7 | P70-P74 Transitory endocrine and metabolic disorders specific to fetus and newborn | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8 | P75-P78 Digestive system disorders of fetus and newborn | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9 | P80-P83 Conditions involving the integument and temperature regulation of fetus and newborn | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10 | P90-P96 Other disorders originating in the perinatal period | | 18 | 18 | 15 | 18 | 1 | 1 | 1 | 1 | 92,594 | 220,983 | 160,506 | 474,084 |
| | P00-P96 Total | | 18 | 18 | 17 | 18 | 20 | 20 | 20 | 20 | 2,631,861 | 3,820,092 | 3,154,718 | 9,606,673 |

3.16c. Releases by Facility

All natural gas compressor stations in NYS reported chemical releases associated with certain conditions originating in the perinatal period.

Six of the 7 top polluters were facilities operated by the Tennessee Gas Pipeline Company, including the top 4.

Tennessee Gas Pipeline Company Compressor Station 245, ranked first with 6.6 million pounds (29.3%), followed by Compressor Station 229 in Eden (3.7 million pounds or 16.4%) and Compressor Station 249 in Carlisle (2.4 million pounds or 10.5%). In aggregate, these three facilities were responsible for 17.9 million pounds, slightly more than one-half (50.9%) of the state total.

The top 5 facilities were responsible for 22.5 million pounds, slightly less than two-thirds (66%) of all releases.

The facility average was 2 million pounds over 7 years or 278,879 pounds each year.

Table 3.16c.

Certain Conditions Originating in the Perinatal Period by Facility (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Facility | | Location | | Chemicals | | | 7 Years (estimate) | | |
|----------|-----------------------|--------------------|------------|-----------|-----|-----|--------------------|------------|-------|
| Rank | Facility Name (Short) | Town | County | '08 | '11 | '14 | Average | Tot. Lbs. | % |
| 1 | TGPC CS 245 | Winfield | Herkimer | 16 | 16 | 10 | 942,678 | 6,598,747 | 29.32 |
| 2 | TGPC 229 & TEG DF | Eden | Erie | 16 | 15 | 16 | 526,098 | 3,682,688 | 16.36 |
| 3 | TGPC CS 249 | Carlisle | Schoharie | 16 | 10 | 10 | 337,100 | 2,359,704 | 10.48 |
| 4 | TGPC CS 254 | Chatham | Columbia | 14 | 10 | 6 | 184,150 | 1,289,055 | 5.73 |
| 5 | AGT SOUTHEAST CS | Southeast | Putnam | 14 | 10 | 17 | 179,875 | 1,259,125 | 5.59 |
| 6 | TGPC CS 241 | LaFayette | Onondaga | 15 | 12 | 15 | 178,380 | 1,248,661 | 5.55 |
| 7 | TGPC CS 237 | Manchester, Phelps | Ontario | 5 | 5 | 2 | 149,469 | 1,046,289 | 4.65 |
| 8 | AGT Stony Point CS | Stony Point | Rockland | 18 | 9 | 10 | 139,970 | 979,796 | 4.35 |
| 9 | NFGSC Concord CS | Concord | Erie | 7 | 5 | 7 | 131,814 | 922,698 | 4.10 |
| 10 | DTI Borger CS | Ithaca | Tompkins | 16 | 16 | 10 | 89,289 | 625,023 | 2.78 |
| 11 | TGPC CS 224 | Clymer | Chautauqua | 16 | 16 | 16 | 68,616 | 480,315 | 2.13 |
| 12 | NFGSC Beech Hill CS | Willing | Allegany | 10 | 10 | 10 | 64,286 | 450,005 | 2.00 |
| 13 | NFGSC Independence CS | Andover | Allegany | 10 | 6 | 10 | 54,734 | 383,143 | 1.70 |
| 14 | TGPC CS 230-C | Lockport | Niagara | 14 | 13 | 14 | 44,297 | 310,080 | 1.38 |
| 15 | DTI Woodhull Station | Woodhull | Steuben | 16 | 19 | 20 | 40,062 | 280,440 | 1.25 |
| 16 | NFGSC Nashville CS | Hanover | Chautauqua | 14 | 14 | 0 | 38,896 | 272,276 | 1.21 |
| 17 | TGPC CS 233 | York | Livingston | 14 | 10 | 1 | 25,581 | 179,072 | 0.80 |
| 18 | DTI Utica Station | Frankfort | Herkimer | 14 | 16 | 20 | 19,886 | 139,202 | 0.62 |
| | | | | 20 | 20 | 20 | 3,215,181 | 22,506,319 | 100% |

3.16d. Releases by DEC Region

The 18 compressor stations analyzed are in 6 of New York State's 9 DEC regions. All 6 regions had releases of chemicals associated with certain conditions originating in the perinatal period.

Region 6, Western Adirondacks/Eastern Lake Ontario, ranked first with 6.7 million pounds (30.1%), closely followed by Region 9, Western New York (6.4 million pounds or 28.6%). Region 4, Capital Region/Northern Catskills, ranked third with 3.6 million pounds (16.3%).

Table 3.16d.

Certain Conditions Originating in the Perinatal Period by County by DEC Region (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| NYS DEC Region | | County | | 3 Years: 2008, 2011, 2014 | | | 7-Year Estimate: 2008-2014 | | |
|----------------|-----------------------------------|------------|------|---------------------------|------|--------------|----------------------------|--------------|-------|
| Rank | Number \ Name | Name | Rank | Fac's | Ch's | Total Pounds | Average Pounds | Total Pounds | % |
| 1 | 6: W Adirondacks / E Lake Ontario | Herkimer | 1 | 2 | 20 | 2,887,693 | 962,564 | 6,737,950 | 30.06 |
| 2 | 9: Western New York | Allegany | 9 | 2 | 11 | 357,064 | 119,021 | 833,149 | 3.72 |
| | | Chautauqua | 10 | 2 | 20 | 283,643 | 94,548 | 661,833 | 2.95 |
| | | Erie | 2 | 2 | 17 | 1,973,737 | 657,912 | 4,605,387 | 20.55 |
| | | Niagara | 12 | 1 | 14 | 132,892 | 44,297 | 310,080 | 1.38 |
| | | | | 7 | 20 | 2,747,335 | 915,778 | 6,410,449 | 28.60 |
| 3 | 4: Capital Region / N Catskills | Columbia | 4 | 1 | 14 | 552,453 | 184,151 | 1,289,056 | 5.75 |
| | | Schoharie | 3 | 1 | 16 | 1,011,302 | 337,101 | 2,359,705 | 10.53 |
| | | | | 2 | 19 | 1,563,754 | 521,251 | 3,648,760 | 16.28 |
| 4 | 3: Lower Hudson Valley | Putnam | 5 | 1 | 18 | 539,625 | 179,875 | 1,259,126 | 5.62 |
| | | Rockland | 8 | 1 | 18 | 419,913 | 139,971 | 979,796 | 4.37 |
| | | | | 2 | 20 | 959,538 | 319,846 | 2,238,922 | 9.99 |
| 5 | 7: Central New York | Onondaga | 6 | 1 | 15 | 535,141 | 178,380 | 1,248,662 | 5.57 |
| | | Tompkins | 11 | 1 | 16 | 267,867 | 89,289 | 625,024 | 2.79 |
| | | | | 2 | 20 | 803,008 | 267,669 | 1,873,686 | 8.36 |
| 6 | 8: Western Finger Lakes | Livingston | 14 | 1 | 14 | 76,745 | 25,582 | 179,073 | 0.80 |
| | | Ontario | 7 | 1 | 5 | 448,410 | 149,470 | 1,046,290 | 4.67 |
| | | Steuben | 13 | 1 | 20 | 120,189 | 40,063 | 280,441 | 1.25 |
| | | | | 3 | 20 | 645,344 | 215,115 | 1,505,803 | 6.72 |
| | | | | 18 | 20 | 9,606,673 | 3,202,224 | 22,415,571 | 100% |

3.16e. Releases by County

All 14 counties where compressor stations are located reported releases of chemicals linked to certain conditions originating in the perinatal period.

Herkimer County ranked first with 9.8 million pounds, (28%) of the state total, followed by Erie County (6.3 million pounds or 18.1%) and Schoharie County (3.6 million pounds or 10.4%). These three counties are responsible for 19.7 million pounds (56.4%) of all toxic releases.

The top five counties were responsible for 24.5 million pounds or 70% of the state total.

The country average was 2.5 million pounds over a 7-year period or 356,756 pounds annually.

Table 3.16e.

Certain Conditions Originating in the Perinatal Period by County (ranked)

NYS Natural Gas Compressor Stations, 2008-2014

| Rank | County | NYS DEC Region | 3 Years: 2008, 2011, 2014 | | | 7-Year Estimate: 2008-2014 | | |
|------|------------|--|---------------------------|-----------|------------------|----------------------------|-------------------|-------------|
| | | | Fac's | Ch's | Total Pounds | Average Pounds | Total Pounds | % |
| 1 | Herkimer | 6: Western Adirondacks/E. Lake Ontario | 2 | 20 | 2,887,693 | 962,564 | 6,737,950 | 30.06 |
| 2 | Erie | 9: Western New York | 2 | 17 | 1,973,737 | 657,912 | 4,605,387 | 20.55 |
| 3 | Schoharie | 4: Capital Region/Northern Catskills | 1 | 16 | 1,011,301 | 337,100 | 2,359,704 | 10.53 |
| 4 | Columbia | 4: Capital Region/Northern Catskills | 1 | 14 | 552,452 | 184,150 | 1,289,055 | 5.75 |
| 5 | Putnam | 3: Lower Hudson Valley | 1 | 18 | 539,625 | 179,875 | 1,259,125 | 5.62 |
| 6 | Onondaga | 7: Central New York | 1 | 15 | 535,140 | 178,380 | 1,248,661 | 5.57 |
| 7 | Ontario | 8: Western Finger Lakes | 1 | 5 | 448,409 | 149,469 | 1,046,289 | 4.67 |
| 8 | Rockland | 3: Lower Hudson Valley | 1 | 18 | 419,912 | 139,970 | 979,796 | 4.37 |
| 9 | Allegany | 9: Western New York | 2 | 11 | 357,063 | 119,021 | 833,148 | 3.72 |
| 10 | Chautauqua | 9: Western New York | 2 | 20 | 283,642 | 94,547 | 661,832 | 2.95 |
| 11 | Tompkins | 7: Central New York | 1 | 16 | 267,867 | 89,289 | 625,023 | 2.79 |
| 12 | Niagara | 9: Western New York | 1 | 14 | 132,891 | 44,297 | 310,080 | 1.38 |
| 13 | Steuben | 8: Western Finger Lakes | 1 | 20 | 120,188 | 40,062 | 280,440 | 1.25 |
| 14 | Livingston | 8: Western Finger Lakes | 1 | 14 | 76,745 | 25,581 | 179,072 | 0.80 |
| | | | 18 | 22 | 9,606,665 | 3,202,217 | 22,415,562 | 100% |

Table 3.16f.

Certain Conditions Originating in the Perinatal Period by chemical

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| # | Chemical name | U.S. EPA National Emissions Inventory Pounds | Congenital malformations, deformations and chromosomal abnormalities | Congenital malformations and deformations | Nervous system | Eye, ear, face and neck | Circulatory system | Respiratory system | Digestive system | Genital organs | Urinary system | Musculoskeletal system | Other | Chromosomal abnormalities, nec | California Proposition 65 Status |
|----|----------------------------------|--|--|---|----------------|-------------------------|--------------------|--------------------|------------------|----------------|----------------|------------------------|---------|--------------------------------|----------------------------------|
| | | | Q00-Q99 | Q00-Q89 | Q00-Q07 | Q10-Q18 | Q20-Q28 | Q30-Q34 | Q35-Q45 | Q50-Q56 | Q60-Q64 | Q65-Q79 | Q80-Q89 | Q90-Q99 | CA P65 |
| | | | 1 | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.7 | 1.8 | 1.9 | 2 | | |
| | | | 59 | 57 | 16 | 4 | 9 | 4 | 19 | 2 | 9 | 19 | 55 | 32 | |
| 1 | Acetaldehyde | 65,969.0555 | Y | Y | Y | Y | | | Y | | Y | Y | Y | Y | |
| 2 | Acrolein | 52,723.4283 | Y | Y | | | | | | | | | Y | | |
| 3 | Anthracene | 9.9008 | Y | Y | | | | | | | | | Y | Y | |
| 4 | Arsenic | 0.0631 | Y | Y | Y | | Y | Y | Y | | | | Y | Y | |
| 5 | Benz[a]anthracene | 19.4738 | Y | Y | | | | | | | | | Y | Y | |
| 6 | Benzene | 21,240.5186 | Y | Y | Y | | Y | | Y | | | Y | Y | Y | Known |
| 7 | Benzo[j,k]fluorene | 10.6660 | Y | Y | | | | | | | | | Y | | |
| 8 | Benzo[a]pyrene | 0.0133 | Y | Y | | | | | | | | | Y | Y | |
| 9 | Benzo[b]fluoranthene | 0.6858 | Y | Y | | | | | | | | | Y | | |
| 10 | Benzo[e]pyrene | 0.0581 | Y | Y | | | | | | | | | Y | | |
| 11 | Benzo[g,h,i]perylene | 1.7487 | Y | Y | | | | | | | | | Y | Y | |
| 12 | Benzo[k]fluoranthene | 0.0019 | Y | Y | | | | | | | | | Y | | |
| 13 | Beryllium | 0.0034 | Y | Y | | | | | | | | | Y | | |
| 14 | Biphenyl | 690.3042 | Y | Y | | | | | | | | | Y | | |
| 15 | Butadiene, 1,3- | 4,718.8745 | Y | Y | | | | | | | | Y | Y | Y | Known |
| 16 | Cadmium | 30.4906 | Y | Y | Y | Y | Y | | Y | | Y | Y | Y | Y | Known |
| 17 | Carbon monoxide | 12,359,731.3420 | Y | Y | Y | | Y | | Y | | | | Y | | Known |
| 18 | Carbon tetrachloride | 281.6842 | Y | Y | Y | | | | Y | | | Y | Y | | |
| 19 | Chlorobenzene | 171.9160 | Y | Y | | | | Y | Y | | | Y | Y | Y | |
| 20 | Chloroethane (Ethyl chloride) | 5.9185 | Y | Y | | | | | | | | | Y | | |
| 21 | Chloroform | 192.8606 | Y | Y | Y | | | | Y | | Y | Y | Y | Y | Known |
| 22 | Chrysene | 4.0913 | Y | Y | | | | | | | | | Y | Y | |
| 23 | Cobalt | 0.0264 | Y | Y | | | | | | | | | Y | Y | |
| 24 | Dibenz[a,h]anthracene | 0.0000 | Y | Y | | | | | | | | | Y | Y | |
| 25 | Dichloropropene, 1,3- | 160.9530 | Y | Y | | | | | | | | | Y | Y | |
| 26 | Dimethylbenz[a]anthracene, 7,12- | 0.0033 | Y | | | | | | | | | | | Y | |
| 27 | Ethylbenzene | 2,794.3829 | Y | Y | | | | | | | | Y | Y | Y | |
| 28 | Ethylene dibromide | 346.9677 | Y | Y | | | | Y | | | | | Y | Y | Known |
| 29 | Ethylene dichloride | 150.8763 | Y | Y | | | | | | | | | Y | Y | |
| 30 | Fluorene | 28.0605 | Y | Y | | | | | | | | | Y | | |
| 31 | Formaldehyde | 1,309,335.5542 | Y | Y | | | | | Y | | Y | Y | Y | Y | |
| 32 | Hexane, n- | 12,183.8539 | Y | Y | | | | | | | Y | Y | Y | Y | |
| 33 | Indeno[1,2,3-cd]pyrene | 0.0240 | Y | Y | | | | | | | | | Y | | |

| # | Chemical name | U.S. EPA National Emissions Inventory Pounds | Congenital malformations, deformations and chromosomal abnormalities | Congenital malformations and deformations | Nervous system | Eye, ear, face and neck | Circulatory system | Respiratory system | Digestive system | Genital organs | Urinary system | Musculoskeletal system | Other | Chromosomal abnormalities, nec | California Proposition 65 Status |
|----|--------------------------------------|--|---|---|----------------|-------------------------|--------------------|--------------------|------------------|----------------|----------------|------------------------|---------|--------------------------------|----------------------------------|
| | | | Q00-Q99 | Q00-Q89 | Q00-Q07 | Q10-Q18 | Q20-Q28 | Q30-Q34 | Q35-Q45 | Q50-Q56 | Q60-Q64 | Q65-Q79 | Q80-Q89 | Q90-Q99 | CA P65 |
| | | | | 1 | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.7 | 1.8 | 1.9 | 2 | |
| | | | 59 | 57 | 16 | 4 | 9 | 4 | 19 | 2 | 9 | 19 | 55 | 32 | |
| 34 | Lead | 0.5586 | Y | Y | Y | | Y | | | | | Y | Y | Y | Known |
| 35 | Manganese | 350.2412 | Y | Y | Y | | | Y | Y | | | | Y | | |
| 36 | Mercury | 70.0315 | Y | Y | Y | | | | | | | | Y | | |
| 37 | Methane dichloride [1910.1052] | 628.7595 | Y | Y | | | | | | | Y | Y | Y | Y | |
| 38 | Methanol | 19,333.1517 | Y | Y | Y | Y | | | Y | Y | Y | Y | Y | | |
| 39 | Methylcholanthrene, 3- | 0.0003 | Y | | | | | | | | | | | Y | |
| 40 | Naphthalene | 696.4536 | Y | Y | | Y | | | | | | Y | Y | Y | |
| 41 | Nickel | 691.7926 | Y | Y | | | | | | | | | Y | | Candidate |
| 42 | Nitrogen oxides (NO2) | 18,082,570.5018 | Y | Y | Y | | | | Y | | | | | | |
| 43 | Perchloroethylene | 8.9808 | Y | Y | | | | | Y | | | Y | Y | Y | |
| 44 | Phenanthrene | 47.9187 | Y | Y | | | | | | | | | Y | | |
| 45 | Phenol | 706.0520 | Y | Y | | | | | Y | | | Y | Y | Y | |
| 46 | PM 2.5 Primary (Filt + Cond) | 1,106,197.8579 | Y | Y | | | Y | | Y | | | | Y | | |
| 47 | PM10 Primary (Filt + Cond) | 1,259,744.3362 | Y | Y | | | Y | | Y | | | | Y | | |
| 48 | Propylene dichloride | 163.9497 | Y | Y | | | | | | | | | Y | | |
| 49 | Propylene oxide | 614.7228 | Y | Y | | | | | Y | | | Y | Y | Y | |
| 50 | Pyrene | 7.0711 | Y | Y | | | | | | | | | Y | | |
| 51 | Selenium | 0.0064 | Y | Y | | | | | | | | | Y | | |
| 52 | Styrene | 233.7242 | Y | Y | | | | | | Y | Y | | Y | Y | |
| 53 | Sulfur dioxide | 186,778.1614 | Y | Y | | | Y | | Y | | | | Y | | |
| 54 | Tetrachloroethane, 1,1,2,2- | 308.7690 | Y | Y | | | | | | | | | Y | Y | |
| 55 | Toluene | 19,307.6774 | Y | Y | Y | | | | | | Y | Y | Y | Y | Known |
| 56 | Trichloroethane, 1,1,2- | 247.4703 | Y | Y | Y | | | | | | | | | | |
| 57 | Vinyl chloride | 106.6165 | Y | Y | Y | | | | | | | | Y | Y | |
| 58 | Volatile organic compounds (VOCs) | 4,920,395.6676 | Y | Y | Y | | Y | | Y | | | | Y | | |
| 59 | Xylene (mixed isomers) | 8,394.2111 | Y | Y | | | | | | | | Y | Y | | |

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17. Congenital Malformations, Deformations & Chromosomal Abnormalities (Q00-Q99)

3.17a. Releases by Chemical

Fifty-nine of the 70 chemicals released by NYS natural gas compressor stations are associated with congenital malformations, deformations and chromosomal abnormalities (ICD-10, Chapter 17).

Releases of these toxicants were reported by all 18 stations and totaled an estimated 39.4 million pounds from 2008 to 2014--an annual average of 5.6 million pounds.

Or, to put it differently, ***of the 40.2 million pounds of chemicals released by NYS's compressor stations, 98% have been associated with congenital malformations, deformations and chromosomal abnormalities.***

Nitrogen oxides ranked first with 18.1 million pounds, slightly less than one-half (45.9%) of the state total. Carbon monoxide was second (12.4 million pounds or 31.3%), followed by volatile organic compounds (4.9 million pounds or 12.5%). These three chemicals accounted for 35.4 million pounds or 89.7 of all releases.

The top 10 chemicals were responsible for virtually all releases (99.8%).

The annual average release was 5.6 million pounds.

Table 3.17a.

Congenital Malformations, Deformations & Chromosomal Abnormalities

NYS Natural Gas Compressor Stations, 2008-2014

| Chemical | | Location | | | 3 Years | 7 Year Estimate: 2008 to 2014 | | |
|----------|-----------------------------|----------|------|-------|------------|-------------------------------|------------|-------|
| Rank | Name | Fac's | Cn's | Reg's | Pounds | Average | Pounds | % |
| 1 | Nitrogen Oxides | 18 | 14 | 6 | 7,749,673 | 2,583,224 | 18,082,571 | 45.85 |
| 2 | Carbon Monoxide | 18 | 14 | 6 | 5,297,028 | 1,765,676 | 12,359,731 | 31.34 |
| 3 | Volatile Organic Compounds | 18 | 14 | 6 | 2,108,741 | 702,914 | 4,920,396 | 12.48 |
| 4 | Formaldehyde | 18 | 14 | 6 | 561,144 | 187,048 | 1,309,336 | 3.32 |
| 5 | PM10 Primary (Filt + Cond) | 18 | 14 | 6 | 539,890 | 179,963 | 1,259,744 | 3.19 |
| 6 | PM2.5 Primary (Filt + Cond) | 18 | 14 | 6 | 474,085 | 158,028 | 1,106,198 | 2.80 |
| 7 | Sulfur Dioxide | 18 | 14 | 6 | 80,048 | 26,683 | 186,778 | 0.47 |
| 8 | Acetaldehyde | 14 | 13 | 6 | 28,272 | 9,424 | 65,969 | 0.17 |
| 9 | Acrolein | 14 | 13 | 6 | 22,596 | 7,532 | 52,723 | 0.13 |
| 10 | Benzene | 16 | 13 | 6 | 9,103 | 3,034 | 21,241 | 0.05 |
| | | 18 | 14 | 6 | 16,870,580 | 5,623,527 | 39,364,686 | 99.81 |

3.17b. Releases by ICD Category

Congenital malformations, deformations & chromosomal abnormalities into 2 major disease categories. Chemicals released by natural gas compressor stations in NYS are positively associated with both.

It should be remembered, that a single chemical can be associated with more than one subcategory of disease within an ICD disease group (chapter) as well as with more than one disease group.

Q00-Q89: Congenital Malformation and Deformations

Fifty-seven chemicals are associated with congenital malformation and deformations. This includes:

Q00-Q07: Sixteen chemicals associated with nervous system malformations and deformations, including: brain abnormalities and defects (anencephaly, holoprosencephaly, microcephaly), CNS abnormalities and defects, cognitive developmental delay with greater language impairment, cognitive function, lower IQ, neural tube defects (opening to the spinal cord at the base of the brain), neurological impairment, spatial memory function impairment, and spina bifida.

Q10-Q18: Four chemicals are associated with eye, ear, face and neck malformations and deformations: ear abnormalities, eye abnormalities (anophthalmia and cataracts), facial clefts, and gross facial agenesis.

Q20-Q28: Ten chemicals are associated with circulatory system malformations and deformations, including

Table 3.17b.

Congenital Malformations, Deformations & Chromosomal Abnormalities by ICD Code Group

NYS Natural Gas Compressor Stations, 2008-2014

| ICD-10 | | | Facilities | | | | Chemicals | | | | Pounds | | | |
|--------|-------------|---|------------|-----|-----|-----|-----------|-----|-----|-----|-----------|-----------|-----------|------------|
| # | Description | | '08 | '11 | '14 | Tot | '08 | '11 | '14 | Tot | 2008 | 2011 | 2014 | Total |
| 1 | Q00-Q89 | Congenital malformations and deformations | 18 | 18 | 17 | 18 | 57 | 54 | 54 | 57 | 4,393,806 | 6,607,676 | 5,900,691 | 16,902,175 |
| 1.1 | Q00-Q07 | Nervous system | 18 | 18 | 17 | 18 | 16 | 16 | 16 | 16 | 4,068,877 | 5,882,704 | 5,258,344 | 15,209,926 |
| 1.2 | Q10-Q18 | Eye, ear, face and neck | 15 | 15 | 12 | 15 | 4 | 4 | 4 | 4 | 5,825 | 19,569 | 11,475 | 36,869 |
| 1.3 | Q20-Q28 | Circulatory system | 18 | 18 | 17 | 18 | 10 | 10 | 10 | 10 | 4,269,779 | 6,336,905 | 5,651,896 | 16,258,581 |
| 1.4 | Q30-Q34 | Respiratory system | 14 | 8 | 7 | 14 | 4 | 4 | 4 | 4 | 150 | 107 | 113 | 372 |
| 1.5 | Q35-Q45 | Digestive system | 18 | 18 | 17 | 18 | 17 | 17 | 17 | 17 | 4,386,043 | 6,586,345 | 5,884,324 | 16,856,713 |
| 1.6 | Q50-Q56 | Genital organs | 6 | 7 | 8 | 8 | 2 | 2 | 2 | 2 | 1,399 | 4,373 | 2,612 | 8,385 |
| 1.7 | Q60-Q64 | Urinary system | 18 | 17 | 16 | 18 | 9 | 9 | 9 | 9 | 119,382 | 254,922 | 237,359 | 611,663 |
| 1.8 | Q65-Q79 | Musculoskeletal system | 18 | 18 | 16 | 18 | 19 | 19 | 19 | 19 | 122,314 | 262,300 | 243,932 | 628,547 |
| 1.9 | Q80-Q89 | Other | 18 | 18 | 17 | 18 | 55 | 52 | 52 | 55 | 2,124,445 | 3,614,575 | 3,413,375 | 9,152,395 |
| 2 | Q90-Q99 | Chromosomal abnormalities, nec | 18 | 18 | 16 | 18 | 30 | 31 | 31 | 32 | 120,669 | 256,739 | 239,709 | 617,118 |
| | Q00-Q99 | Total | 18 | 18 | 17 | 18 | 57 | 56 | 56 | 59 | 4,393,806 | 6,607,676 | 5,900,691 | 16,902,175 |

3.17c. Releases by Facility

All natural gas compressor stations in NYS reported chemical releases associated with congenital malformations, deformations & chromosomal abnormalities.

The top 6 polluters were facilities operated by the Tennessee Gas Pipeline Company.

Tennessee Gas Pipeline Company Compressor Station 245, ranked first with 10.4 million pounds, more than one-quarter (26.2%) of the state total. Compressor Station 229 in Eden ranked second (5 million pounds or 12.7%) followed by Compressor Station 249 in Carlisle (4.2 million pounds or 10.7%). In aggregate, these three facilities were responsible for 19.7 million pounds, slightly less than one-half (49.6%) of the state total.

The top 5 facilities were responsible for 25 million pounds, slightly less than two-thirds (63.1%) of all releases.

The facility average was 2.1 million pounds over 7 years or 314,643 pounds each year.

Table 3.17c.

Congenital Malformations, Deformations & Chromosomal Abnormalities by Facility (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Facility | | Location | | Chemicals | | | 7 Years (estimate) | | |
|----------|-----------------------|--------------------|------------|-----------|-----------|-----------|--------------------|-------------------|-------------|
| Rank | Facility Name (Short) | Town | County | '08 | '11 | '14 | Average | Tot. Lbs. | % |
| 1 | TGPC CS 245 | Winfield | Herkimer | 43 | 42 | 23 | 1,484,232 | 10,389,625 | 26.21 |
| 2 | TGPC 229 & TEG DF | Eden | Erie | 45 | 42 | 43 | 721,420 | 5,049,941 | 12.74 |
| 3 | TGPC CS 249 | Carlisle | Schoharie | 43 | 24 | 24 | 604,523 | 4,231,660 | 10.67 |
| 4 | TGPC CS 241 | LaFayette | Onondaga | 41 | 32 | 41 | 425,236 | 2,976,652 | 7.51 |
| 5 | TGPC CS 254 | Chatham | Columbia | 24 | 15 | 8 | 337,861 | 2,365,027 | 5.97 |
| 6 | TGPC CS 237 | Manchester, Phelps | Ontario | 8 | 7 | 5 | 323,113 | 2,261,791 | 5.71 |
| 7 | AGT Stony Point CS | Stony Point | Rockland | 40 | 22 | 20 | 282,935 | 1,980,542 | 5.00 |
| 8 | NFGSC Concord CS | Concord | Erie | 10 | 8 | 10 | 243,579 | 1,705,053 | 4.30 |
| 9 | AGT SOUTHEAST CS | Southeast | Putnam | 24 | 17 | 40 | 233,541 | 1,634,787 | 4.12 |
| 10 | NFGSC Beech Hill CS | Willing | Allegany | 18 | 18 | 19 | 196,128 | 1,372,896 | 3.46 |
| 11 | NFGSC Independence CS | Andover | Allegany | 13 | 9 | 15 | 192,763 | 1,349,341 | 3.40 |
| 12 | TGPC CS 224 | Clymer | Chautauqua | 42 | 40 | 42 | 162,655 | 1,138,582 | 2.87 |
| 13 | DTI Woodhull Station | Woodhull | Steuben | 38 | 47 | 51 | 116,594 | 816,160 | 2.06 |
| 14 | DTI Borger CS | Ithaca | Tompkins | 38 | 39 | 18 | 110,770 | 775,390 | 1.96 |
| 15 | NFGSC Nashville CS | Hanover | Chautauqua | 32 | 30 | 0 | 88,560 | 619,919 | 1.56 |
| 16 | TGPC CS 230-C | Lockport | Niagara | 24 | 23 | 24 | 68,322 | 478,255 | 1.21 |
| 17 | DTI Utica Station | Frankfort | Herkimer | 32 | 37 | 50 | 39,732 | 278,121 | 0.70 |
| 18 | TGPC CS 233 | York | Livingston | 24 | 15 | 4 | 31,615 | 221,306 | 0.56 |
| | | | | 57 | 56 | 56 | 5,663,578 | 39,645,048 | 100% |

3.17d. Releases by DEC Region

The 18 compressor stations analyzed are in 6 of New York State's 9 DEC regions. All 6 regions had releases of chemicals associated with congenital malformations, deformations and chromosomal abnormalities.

Region 9, Western New York, ranked first with 11.5 million pounds (29.2%), closely followed by Region 6, Western Adirondacks/Eastern Lake Ontario (10.7 million pounds or 27.1%). Region 4, Capital Region/Northern Catskills, ranked third with 6.7 million pounds (16.7%).

Table 3.17d.

Congenital Malformations, Deformations & Chromosomal Abnormalities by DEC Region (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| NYS DEC Region | | County | | 3 Years: 2008, 2011, 2014 | | | 7-Year Estimate: 2008-2014 | | |
|----------------|-----------------------------------|------------|------|---------------------------|------|--------------|----------------------------|--------------|-------|
| Rank | Number \ Name | Name | Rank | Fac's | Ch's | Total Pounds | Average Pounds | Total Pounds | % |
| 1 | 9: Western New York | Allegany | 5 | 2 | 20 | 1,166,673 | 388,891 | 2,722,237 | 6.90 |
| | | Chautauqua | 10 | 2 | 54 | 665,084 | 221,695 | 1,551,861 | 3.93 |
| | | Erie | 2 | 2 | 47 | 2,894,998 | 964,999 | 6,754,994 | 17.13 |
| | | Niagara | 13 | 1 | 24 | 204,966 | 68,322 | 478,254 | 1.21 |
| | | | | 7 | 57 | 4,931,721 | 1,643,907 | 11,507,346 | 29.18 |
| 2 | 6: W Adirondacks / E Lake Ontario | Herkimer | 1 | 2 | 58 | 4,571,891 | 1,523,964 | 10,667,746 | 27.05 |
| 3 | 4: Capital Region / N Catskills | Columbia | 6 | 1 | 24 | 1,013,583 | 337,861 | 2,365,026 | 6.00 |
| | | Schoharie | 3 | 1 | 43 | 1,813,569 | 604,523 | 4,231,659 | 10.73 |
| | | | | 2 | 48 | 2,827,151 | 942,384 | 6,596,685 | 16.73 |
| 4 | 7: Central New York | Onondaga | 4 | 1 | 41 | 1,275,708 | 425,236 | 2,976,651 | 7.55 |
| | | Tompkins | 12 | 1 | 41 | 332,310 | 110,770 | 775,390 | 1.97 |
| | | | | 2 | 58 | 1,608,018 | 536,006 | 3,752,041 | 9.51 |
| 6 | 3: Lower Hudson Valley | Putnam | 9 | 1 | 42 | 700,623 | 233,541 | 1,634,787 | 4.15 |
| | | Rockland | 8 | 1 | 42 | 848,804 | 282,935 | 1,980,541 | 5.02 |
| | | | | 2 | 53 | 1,549,427 | 516,476 | 3,615,328 | 9.17 |
| 5 | 8: Western Finger Lakes | Livingston | 14 | 1 | 24 | 94,845 | 31,615 | 221,305 | 0.56 |
| | | Ontario | 7 | 1 | 8 | 969,339 | 323,113 | 2,261,790 | 5.73 |
| | | Steuben | 11 | 1 | 54 | 349,783 | 116,594 | 816,160 | 2.07 |
| | | | | 3 | 54 | 1,413,967 | 471,322 | 3,299,255 | 8.37 |
| 18 | 59 | | | | | 16,902,175 | 5,634,058 | 39,438,401 | 100% |

3.17e. Releases by County

All 14 counties where compressor stations are located reported releases of chemicals linked to congenital malformations, deformations & chromosomal abnormalities.

Herkimer County ranked first with 10.7 million pounds or (27%) of the state total, followed by Erie County (6.8 million pounds or 17.1%) and Schoharie County (4.2 million pounds or 10.7%). These three counties are responsible for 21.7 million pounds (56.4%) of all toxic releases.

The top five counties were responsible for 27.4 million pounds or more than two-thirds (69.34) of the state total.

The country average was 2.8 million pounds over a 7-year period or 402,433 pounds annually.

Table 3.17e.

Congenital Malformations, Deformations & Chromosomal Abnormalities by County (ranked)

NYS Natural Gas Compressor Stations, 2008-2014

| Rank | County | NYS DEC Region | 3 Years: 2008, 2011, 2014 | | | 7-Year Estimate: 2008-2014 | | |
|------|------------|--|---------------------------|-----------|-------------------|----------------------------|-------------------|-------------|
| | | | Fac's | Ch's | Total Pounds | Average Pounds | Total Pounds | % |
| 1 | Herkimer | 6: Western Adirondacks/E. Lake Ontario | 2 | 58 | 4,571,891 | 1,523,964 | 10,667,747 | 27.05 |
| 2 | Erie | 9: Western New York | 2 | 47 | 2,894,998 | 964,999 | 6,754,994 | 17.13 |
| 3 | Schoharie | 4: Capital Region/Northern Catskills | 1 | 43 | 1,813,569 | 604,523 | 4,231,660 | 10.73 |
| 4 | Onondaga | 7: Central New York | 1 | 41 | 1,275,708 | 425,236 | 2,976,652 | 7.55 |
| 5 | Allegany | 9: Western New York | 2 | 20 | 1,166,673 | 388,891 | 2,722,237 | 6.90 |
| 6 | Columbia | 4: Capital Region/Northern Catskills | 1 | 24 | 1,013,583 | 337,861 | 2,365,027 | 6.00 |
| 7 | Ontario | 8: Western Finger Lakes | 1 | 8 | 969,339 | 323,113 | 2,261,791 | 5.73 |
| 8 | Rockland | 3: Lower Hudson Valley | 1 | 42 | 848,804 | 282,935 | 1,980,542 | 5.02 |
| 9 | Putnam | 3: Lower Hudson Valley | 1 | 42 | 700,623 | 233,541 | 1,634,787 | 4.15 |
| 10 | Chautauqua | 9: Western New York | 2 | 54 | 665,084 | 221,695 | 1,551,862 | 3.93 |
| 11 | Steuben | 8: Western Finger Lakes | 1 | 54 | 349,783 | 116,594 | 816,160 | 2.07 |
| 12 | Tompkins | 7: Central New York | 1 | 41 | 332,310 | 110,770 | 775,390 | 1.97 |
| 13 | Niagara | 9: Western New York | 1 | 24 | 204,966 | 68,322 | 478,255 | 1.21 |
| 14 | Livingston | 8: Western Finger Lakes | 1 | 24 | 94,845 | 31,615 | 221,306 | 0.56 |
| | | | 18 | 59 | 16,902,175 | 5,634,058 | 39,438,408 | 100% |

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3.18. Symptoms, Signs and Abnormal Clinical and Laboratory Findings (R00-R99)

3.18a. Releases by Chemicals

Forty-three of the 70 chemicals released by NYS natural gas compressor stations are associated with congenital malformations, deformations and chromosomal abnormalities (ICD-10, Chapter 18).

Releases of these toxicants were reported by all 18 stations and totaled an estimated 39.4 million pounds from 2008 to 2014--an annual average of 5.6 million pounds.

Or, to put it differently, ***of the 40.2 million pounds of chemicals released by NYS's compressor stations, 98% have been associated with symptoms, signs and abnormal clinical and laboratory findings.***

Nitrogen oxides ranked first with 18.1 million pounds, slightly less than one-half (45.9%) of the state total. Carbon monoxide was second (12.4 million pounds or 31.3%), followed by volatile organic compounds (4.9 million pounds or 12.5%). These three chemicals accounted for 35.4 million pounds or 89.7 of all releases.

The top 10 chemicals were responsible for virtually all releases (99.8%).

The annual average release was 5.6 million pounds.

Table 3.18a.

Symptoms, Signs and Abnormal Clinical and Laboratory Findings by Chemical (Top 10)

NYS Natural Gas Compressor Stations, 2008-2014

| Chemical | | Location | | | 3 Years | 7 Year Estimate: 2008 to 2014 | | |
|----------|-----------------------------|----------|------|-------|------------|-------------------------------|------------|-------|
| Rank | Name | Fac's | Cn's | Reg's | Pounds | Average | Pounds | % |
| 1 | Nitrogen Oxides | 18 | 14 | 6 | 7,749,673 | 2,583,224 | 18,082,571 | 45.85 |
| 2 | Carbon Monoxide | 18 | 14 | 6 | 5,297,028 | 1,765,676 | 12,359,731 | 31.34 |
| 3 | Volatile Organic Compounds | 18 | 14 | 6 | 2,108,741 | 702,914 | 4,920,396 | 12.48 |
| 4 | Formaldehyde | 18 | 14 | 6 | 561,144 | 187,048 | 1,309,336 | 3.32 |
| 5 | PM10 Primary (Filt + Cond) | 18 | 14 | 6 | 539,890 | 179,963 | 1,259,744 | 3.19 |
| 6 | PM2.5 Primary (Filt + Cond) | 18 | 14 | 6 | 474,085 | 158,028 | 1,106,198 | 2.80 |
| 7 | Sulfur Dioxide | 18 | 14 | 6 | 80,048 | 26,683 | 186,778 | 0.47 |
| 8 | Acetaldehyde | 14 | 13 | 6 | 28,272 | 9,424 | 65,969 | 0.17 |
| 9 | Acrolein | 14 | 13 | 6 | 22,596 | 7,532 | 52,723 | 0.13 |
| 10 | Benzene | 16 | 13 | 6 | 9,103 | 3,034 | 21,241 | 0.05 |
| | | 18 | 14 | 6 | 16,870,580 | 5,623,527 | 39,364,686 | 99.81 |

3.18b. Releases by ICD Category

Symptoms, signs and abnormal clinical and laboratory findings into 3 major disease categories. Chemicals released by natural gas compressor stations in NYS are positively associated with two.

It should be remembered, that a single chemical can be associated with more than one subcategory of disease within an ICD disease group (chapter) as well as with more than one disease group.

R00-R69: Symptoms and signs

Forty-two chemicals are associated with symptoms, signs and abnormal clinical and laboratory findings. This includes:

R00-R09: Thirty chemicals are associated with circulatory and respiratory system symptoms: changes in blood pressure, chest discomfort (burning sensation, constriction, pain), dyspnea, epistaxis, heart palpitations, heart rate (bradycardia, tachycardia), phlegm, pulse rate decrease without fall in blood pressure, pulse rate increase without fall in blood pressure, and wheezing.

R10-R19: Twenty-eight chemicals associated with digestive system and abdomen symptoms: abdomen (colic, cramps and pain), nausea or vomiting, and unspecified liver effects.

R20-R23: Thirty-two chemicals are associated with skin and subcutaneous tissue symptoms: skin (burning sensation, cracking, discoloration, pain, paresthesia, and rash), numbness in extremities, and a tingling sensation.

R30-R39: One chemical is associated with urinary system symptoms.

R40-R46: Thirty-four chemicals are associated with cognition, perception, emotional state and behavior: R40 (drowsiness, dizziness, somnolence), R41 (amnesia, confusion, memory disturbances, impairment and loss, mental confusion), R42 (dizziness, giddiness), R42 (lightheadedness and vertigo), R43 (anosmia, olfactory fatigue and unspecified effects), R43 (metallic or unpleasant taste in mouth), R45 (agitation or irritability), and R53 (lethargy).

R47-R49: Four chemicals are associated with speech and voice symptoms: R47 (speech (difficulties, disorders and impairment), and R49 (voice loss and disturbances).

R50-R69: Thirty-five chemicals are associated with general symptoms and signs: R50 (fever), R51 (headache), R53 (asthenia, alteration of classical conditioning, fatigue, listlessness, malaise, weakness), R55 (lowered consciousness), R56 (convulsions), R61 (diaphoresis), R63 (loss or decreased weight gain), R63 (altered fluid and food intake), R68 (chills), and R68 (decreased libido).

R70-R94: Abnormal clinical and laboratory findings, not elsewhere classified

Five chemicals are associated with abnormal clinical and laboratory findings, not elsewhere classified.

Table 3.18b.

Symptoms, Signs and Abnormal Clinical and Laboratory Findings by ICD Code Category

NYS Natural Gas Compressor Stations, 2008-2014

| ICD-10 | | | Facilities | | | | Chemicals | | | | Pounds | | | |
|--------|-------------|---|------------|-----|-----|-----|-----------|-----|-----|-----|-----------|-----------|-----------|------------|
| # | Description | | '08 | '11 | '14 | Tot | '08 | '11 | '14 | Tot | 2008 | 2011 | 2014 | Total |
| 1 | R00-R69 | Symptoms and signs | 18 | 18 | 17 | 18 | 42 | 42 | 42 | 42 | 4,301,427 | 6,386,827 | 5,740,302 | 16,428,557 |
| 1.1 | R00-R09 | Circulatory and respiratory systems | 18 | 18 | 17 | 18 | 30 | 30 | 30 | 30 | 2,775,402 | 4,111,790 | 3,698,584 | 10,585,778 |
| 1.2 | R10-R19 | Digestive system and abdomen | 18 | 18 | 17 | 18 | 28 | 28 | 28 | 28 | 4,296,286 | 6,369,501 | 5,729,821 | 16,395,609 |
| 1.3 | R20-R23 | Skin and subcutaneous tissue | 18 | 18 | 16 | 18 | 32 | 32 | 32 | 32 | 233,958 | 516,707 | 441,385 | 1,192,051 |
| 1.4 | R25-R29 | Nervous and musculoskeletal systems | 18 | 18 | 16 | 18 | 26 | 26 | 26 | 26 | 122,751 | 262,577 | 244,109 | 629,437 |
| 1.5 | R30-R39 | Urinary system | 6 | 7 | 8 | 8 | 1 | 1 | 1 | 1 | 1,381 | 4,324 | 2,580 | 8,285 |
| 1.6 | R40-R46 | Cognition, perception, emotional state and behavior | 18 | 18 | 17 | 18 | 34 | 34 | 34 | 34 | 1,913,213 | 3,125,300 | 2,997,323 | 8,035,836 |
| 1.7 | R47-R49 | Speech and voice | 18 | 17 | 16 | 18 | 4 | 4 | 4 | 4 | 111,704 | 233,516 | 224,349 | 569,571 |
| 1.8 | R50-R69 | General symptoms and signs | 18 | 18 | 17 | 18 | 35 | 35 | 35 | 35 | 4,293,722 | 6,372,351 | 5,681,897 | 16,347,971 |
| 2 | R70-R94 | Abnormal clinical and laboratory findings, not elsewhere classified | 18 | 18 | 17 | 18 | 5 | 5 | 5 | 5 | 1,508,969 | 2,253,122 | 2,012,719 | 5,774,810 |
| 3 | R95-R99 | Ill-defined and unknown causes of mortality | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | R00-R99 | Total | 18 | 18 | 17 | 18 | 43 | 43 | 43 | 43 | 4,394,022 | 6,607,810 | 5,900,809 | 16,902,642 |

3.18c. Releases by Facility

All natural gas compressor stations in NYS reported chemical releases associated with symptoms, signs and abnormal clinical and laboratory findings.

The top 6 polluters were facilities operated by the Tennessee Gas Pipeline Company.

Tennessee Gas Pipeline Company Compressor Station 245, ranked first with 10.4 million pounds, more than one-quarter (26.2%) of the state total. Compressor Station 229 in Eden ranked second (5. million pounds or 12.7%) followed by Compressor Station 249 in Carlisle (4.2 million pounds or 10.7%). In aggregate, these three facilities were responsible for 19.7 million pounds, slightly less than one-half (49.6%) of the state total.

The top 5 facilities were responsible for 25 million pounds, slightly less than two-thirds (63.1%) of all releases.

The facility average was 2.1 million pounds over 7 years or 314,652 pounds each year.

Table 3.18c.

Symptoms, Signs and Abnormal Clinical and Laboratory Findings by Facility (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| Facility | | Location | | Chemicals | | | 7 Years (estimate) | | |
|----------|-----------------------|--------------------|------------|-----------|-----------|-----------|--------------------|-------------------|-------------|
| Rank | Facility Name (Short) | Town | County | '08 | '11 | '14 | Average | Tot. Lbs. | % |
| 1 | TGPC CS 245 | Winfield | Herkimer | 34 | 34 | 23 | 1,484,228 | 10,389,599 | 26.21 |
| 2 | TGPC 229 & TEG DF | Eden | Erie | 32 | 31 | 32 | 721,386 | 5,049,701 | 12.74 |
| 3 | TGPC CS 249 | Carlisle | Schoharie | 34 | 24 | 24 | 604,520 | 4,231,638 | 10.67 |
| 4 | TGPC CS 241 | LaFayette | Onondaga | 33 | 26 | 33 | 425,231 | 2,976,619 | 7.51 |
| 5 | TGPC CS 254 | Chatham | Columbia | 22 | 15 | 8 | 337,861 | 2,365,025 | 5.97 |
| 6 | TGPC CS 237 | Manchester, Phelps | Ontario | 8 | 7 | 5 | 323,113 | 2,261,791 | 5.70 |
| 7 | AGT Stony Point CS | Stony Point | Rockland | 35 | 21 | 21 | 282,934 | 1,980,537 | 5.00 |
| 8 | NFGSC Concord CS | Concord | Erie | 10 | 9 | 11 | 243,583 | 1,705,081 | 4.30 |
| 9 | AGT SOUTHEAST CS | Southeast | Putnam | 22 | 17 | 28 | 233,540 | 1,634,783 | 4.12 |
| 10 | NFGSC Beech Hill CS | Willing | Allegany | 19 | 19 | 20 | 196,224 | 1,373,569 | 3.46 |
| 11 | NFGSC Independence CS | Andover | Allegany | 14 | 9 | 16 | 192,806 | 1,349,642 | 3.40 |
| 12 | TGPC CS 224 | Clymer | Chautauqua | 34 | 32 | 34 | 162,642 | 1,138,497 | 2.87 |
| 13 | DTI Woodhull Station | Woodhull | Steuben | 28 | 35 | 39 | 116,642 | 816,492 | 2.06 |
| 14 | DTI Borger CS | Ithaca | Tompkins | 28 | 28 | 18 | 110,772 | 775,401 | 1.96 |
| 15 | NFGSC Nashville CS | Hanover | Chautauqua | 22 | 22 | 0 | 88,588 | 620,114 | 1.56 |
| 16 | TGPC CS 230-C | Lockport | Niagara | 22 | 21 | 22 | 68,321 | 478,245 | 1.21 |
| 17 | DTI Utica Station | Frankfort | Herkimer | 22 | 26 | 38 | 39,738 | 278,165 | 0.70 |
| 18 | TGPC CS 233 | York | Livingston | 22 | 15 | 4 | 31,615 | 221,303 | 0.56 |
| | | | | 43 | 43 | 43 | 5,663,743 | 39,646,203 | 100% |

3.18d. Releases by DEC Region

The 18 compressor stations analyzed are in 6 of New York State's 9 DEC regions. All 6 regions had releases of chemicals associated with symptoms, signs and abnormal clinical and laboratory findings.

Region 9, Western New York, ranked first with 11.5 million pounds (29.2%), closely followed by Region 6, Western Adirondacks/Eastern Lake Ontario (10.7 million pounds or 27.1%). Region 4, Capital Region/Northern Catskills, ranked third with 6.7 million pounds (16.7%).

Table 3.18e.

Symptoms, Signs and Abnormal Clinical and Laboratory Findings by DEC Region (ranked)

NYS Natural Gas Compressor Station NEI Emissions, 2008 to 2011

| NYS DEC Region | | County | | 3 Years: 2008, 2011, 2014 | | | 7-Year Estimate: 2008-2014 | | |
|----------------|-----------------------------------|------------|------|---------------------------|------|--------------|----------------------------|--------------|-------|
| Rank | Number \ Name | Name | Rank | Fac's | Ch's | Total Pounds | Average Pounds | Total Pounds | % |
| 1 | 9: Western New York | Allegany | 5 | 2 | 21 | 1,167,091 | 389,030 | 2,723,211 | 6.90 |
| | | Chautauqua | 10 | 2 | 42 | 665,103 | 221,701 | 1,551,907 | 3.93 |
| | | Erie | 2 | 2 | 35 | 2,894,907 | 964,969 | 6,754,782 | 17.13 |
| | | Niagara | 13 | 1 | 22 | 204,962 | 68,321 | 478,244 | 1.21 |
| | | | | 7 | 43 | 4,932,063 | 1,644,021 | 11,508,144 | 29.18 |
| 2 | 6: W Adirondacks / E Lake Ontario | Herkimer | 1 | 2 | 42 | 4,571,899 | 1,523,966 | 10,667,764 | 27.05 |
| 3 | 4: Capital Region / N Catskills | Columbia | 6 | 1 | 22 | 1,013,582 | 337,861 | 2,365,024 | 6.00 |
| | | Schoharie | 3 | 1 | 34 | 1,813,559 | 604,520 | 4,231,637 | 10.73 |
| | | | | 2 | 38 | 2,827,141 | 942,380 | 6,596,661 | 16.73 |
| 4 | 7: Central New York | Onondaga | 4 | 1 | 33 | 1,275,694 | 425,231 | 2,976,619 | 7.55 |
| | | Tompkins | 12 | 1 | 28 | 332,315 | 110,772 | 775,401 | 1.97 |
| | | | | 2 | 43 | 1,608,009 | 536,003 | 3,752,020 | 9.51 |
| 6 | 3: Lower Hudson Valley | Putnam | 9 | 1 | 30 | 700,621 | 233,540 | 1,634,782 | 4.15 |
| | | Rockland | 8 | 1 | 36 | 848,801 | 282,934 | 1,980,536 | 5.02 |
| | | | | 2 | 40 | 1,549,423 | 516,474 | 3,615,318 | 9.17 |
| 5 | 8: Western Finger Lakes | Livingston | 14 | 1 | 22 | 94,844 | 31,615 | 221,302 | 0.56 |
| | | Ontario | 7 | 1 | 8 | 969,339 | 323,113 | 2,261,790 | 5.73 |
| | | Steuben | 11 | 1 | 40 | 349,925 | 116,642 | 816,492 | 2.07 |
| | | | | 3 | 40 | 1,414,108 | 471,369 | 3,299,584 | 8.37 |
| | | | | 18 | 43 | 16,902,642 | 5,634,214 | 39,439,491 | 100% |

3.18e. Releases by County

All 14 counties where compressor stations are located reported releases of chemicals associated with symptoms, signs and abnormal clinical and laboratory findings.

Herkimer County ranked first with 10.7 million pounds or (27%) of the state total, followed by Erie County (6.8 million pounds or 17.1%) and Schoharie County (4.2 million pounds or 10.7%). These three counties are responsible for 21.7 million pounds (54.9%) of all toxic releases.

The top five counties were responsible for 27.4 million pounds or more than two-thirds (69.4%) of the state total.

The country average was 2.8 million pounds over a 7-year period or 402,444 pounds annually.

Table 3.18e.

Symptoms, Signs and Abnormal Clinical and Laboratory Findings by County (ranked)

NYS Natural Gas Compressor Stations, 2008-2014

| Rank | County | NYS DEC Region | 3 Years: 2008, 2011, 2014 | | | 7-Year Estimate: 2008-2014 | | |
|------|------------|--|---------------------------|-----------|-------------------|----------------------------|-------------------|-------------|
| | | | Fac's | Ch's | Total Pounds | Average Pounds | Total Pounds | % |
| 1 | Herkimer | 6: Western Adirondacks/E. Lake Ontario | 2 | 42 | 4,571,899 | 1,523,966 | 10,667,764 | 27.05 |
| 2 | Erie | 9: Western New York | 2 | 35 | 2,894,907 | 964,969 | 6,754,782 | 17.13 |
| 3 | Schoharie | 4: Capital Region/Northern Catskills | 1 | 34 | 1,813,559 | 604,520 | 4,231,637 | 10.73 |
| 4 | Onondaga | 7: Central New York | 1 | 33 | 1,275,694 | 425,231 | 2,976,619 | 7.55 |
| 5 | Allegany | 9: Western New York | 2 | 21 | 1,167,091 | 389,030 | 2,723,211 | 6.90 |
| 6 | Columbia | 4: Capital Region/Northern Catskills | 1 | 22 | 1,013,582 | 337,861 | 2,365,024 | 6.00 |
| 7 | Ontario | 8: Western Finger Lakes | 1 | 8 | 969,339 | 323,113 | 2,261,790 | 5.73 |
| 8 | Rockland | 3: Lower Hudson Valley | 1 | 36 | 848,801 | 282,934 | 1,980,536 | 5.02 |
| 9 | Putnam | 3: Lower Hudson Valley | 1 | 30 | 700,621 | 233,540 | 1,634,782 | 4.15 |
| 10 | Chautauqua | 9: Western New York | 2 | 42 | 665,103 | 221,701 | 1,551,907 | 3.93 |
| 11 | Steuben | 8: Western Finger Lakes | 1 | 40 | 349,925 | 116,642 | 816,492 | 2.07 |
| 12 | Tompkins | 7: Central New York | 1 | 28 | 332,315 | 110,772 | 775,401 | 1.97 |
| 13 | Niagara | 9: Western New York | 1 | 22 | 204,962 | 68,321 | 478,244 | 1.21 |
| 14 | Livingston | 8: Western Finger Lakes | 1 | 22 | 94,844 | 31,615 | 221,302 | 0.56 |
| | | | 18 | 43 | 16,902,642 | 5,634,214 | 39,439,491 | 100% |

Chapter 4. Facility Profiles

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Sources:

New York State Department of Environmental Conservation, U.S. Energy Information Administration, U.S. EPA Envirofacts, U.S. EPA National Emissions Inventory

* System Configuration - natural gas pipeline system design layout. Some systems are a combination of the trunk and grid. Where two are shown, the first represents the predominant system design.

Trunk - systems are large-diameter long-distance trunklines that generally tie supply areas to natural gas market areas.

Grid - systems are usually a network of many interconnections and delivery points that operate in and serve major natural gas market areas

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4.1. Algonquin Gas Southeast Compressor Station (Putnam, New York)

4.1a. Facility Profile

Table 4.1a.

Algonquin Gas Southeast Compressor Station: Facility Profile

Putnam NY

| | |
|--|--|
| Facility name, short | AGT SOUTHEAST CS Southeast |
| Facility name, full | Algonquin Gas Southeast Compressor Station |
| EIS Facility ID | 8474311 |
| DEC Region | 3 -- Lower Hudson Valley |
| County | Putnam |
| Town | Southeast |
| Village \ Hamlet | Brewster |
| Address | 142 Tulip Rd |
| Zip | 10509 |
| DEC Facility ID | 3373000060 |
| DEC Permit Type | Air State Facility |
| DEC Permit ID | 3-3730-00060/00013 |
| DEC Permit Effective Date | 7/15/2015 |
| DEC Permit Description | |
| DEC Permit Review Report | |
| Company | Algonquin Gas Transmission LLC |
| Project | Algonquin Incremental Market (AIM) |
| Pipeline | Algonquin |
| Principal Supply Source | Interstate System |
| System Configuration (Primary / Secondary) * | Trunk/Grid |
| Status | Operational |
| Horsepower, existing | 10,302 |
| Horsepower, modifications\expansion | 43,640 |

4.1b. Health Effects of Facility Releases

Table 4.1b.

Algonquin Gas Southeast Compressor Station: Health Effects of Releases by ICD-10 Chapter & Group

Putnam NY

| International Classification of Disease, 10 th edition | | | Ch # | 2008-14 Estimated Lbs. | | State Rank | % of State |
|---|---|---------|-----------|------------------------|------------------|------------|-------------|
| Ch. | Description | Code | | Average | Total | | |
| 2 | Neoplasms | C00-D48 | 40 | 72,072 | 504,510 | 7 | 5.26 |
| 2a | Malignant neoplasms | C00-C97 | 37 | 67,423 | 471,962 | 7 | 5.02 |
| 2a.1 | Lip, oral cavity and pharynx | C00-C14 | 11 | 5,788 | 40,519 | 12 | 2.81 |
| 2a.2 | Digestive organs | C15-C26 | 23 | 5,830 | 40,810 | 12 | 2.79 |
| 2a.3 | Respiratory system and intrathoracic organs | C30-C39 | 28 | 67,391 | 471,742 | 7 | 5.04 |
| 2a.4 | Bone and articular cartilage | C40-C41 | 26 | 59,530 | 416,713 | 7 | 4.75 |
| 2a.5 | Skin | C43-C44 | 8 | 288 | 2,021 | 4 | 7.58 |
| 2a.6 | Connective and soft tissue | C45-C49 | 13 | 614 | 4,303 | 3 | 15.74 |
| 2a.07 | Breast and female genital organs | C50-C58 | 15 | 36,301 | 254,113 | 7 | 5.86 |
| 2a.07.50 | Female breast | C50 | 13 | 28,590 | 200,134 | 8 | 5.28 |
| 2a.07.55 | Uterus | C55 | 3 | 9 | 64 | 9 | 1.31 |
| 2a.07.56 | Ovary | C56 | 3 | 289 | 2,025 | 4 | 7.77 |
| 2a.08 | Male genital organs | C60-C63 | 8 | 4,587 | 32,109 | 11 | 2.65 |
| 2a.09 | Urinary organs | C64-C68 | 16 | 5,538 | 38,766 | 12 | 2.69 |
| 2a.10 | Eye, brain and central nervous system | C69-C72 | 14 | 5,828 | 40,796 | 12 | 2.79 |
| 2a.11 | Endocrine glands and related structures | C73-C75 | 7 | 4,481 | 31,369 | 11 | 2.57 |
| 2a.12 | Secondary and ill-defined | C76-C80 | 6 | 979 | 6,858 | 2 | 20.69 |
| 2a.13 | Stated or presumed to be primary, of lymphoid, haematopoietic and related tissue | C81-C96 | 20 | 37,129 | 259,904 | 7 | 5.93 |
| 2a.14 | Malignant neoplasms of independent (primary) multiple sites | C97 | 0 | 0 | 0 | 0 | 0 |
| 2b | In situ neoplasms | D00-D09 | 2 | 834 | 5,841 | 3 | 13.98 |
| 2c | Benign neoplasms | D10-D36 | 17 | 967 | 6,771 | 8 | 4.09 |
| 2d | Neoplasms of uncertain or unknown behavior | D37-D48 | 27 | 5,582 | 39,074 | 12 | 2.69 |
| 3 | Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism | D50-D89 | 24 | 62,269 | 435,885 | 13 | 2.31 |
| 4 | Endocrine, nutritional and metabolic diseases | E00-E90 | 37 | 48,166 | 337,165 | 8 | 4.71 |
| 5 | Mental and behavioral disorders | F00-F99 | 21 | 62,261 | 435,828 | 13 | 2.31 |
| 6 | Diseases of the nervous system | G00-G99 | 26 | 67,069 | 469,483 | 13 | 2.46 |
| 7 | Diseases of the eye and adnexa | H00-H59 | 27 | 183,354 | 1,283,479 | 7 | 5.17 |
| 8 | Diseases of the ear and mastoid process | H60-H95 | 12 | 57,674 | 403,718 | 13 | 2.31 |
| 9 | Diseases of the circulatory system | I00-I99 | 20 | 55,141 | 385,987 | 13 | 2.38 |
| 10 | Diseases of the respiratory system | J00-J99 | 35 | 233,542 | 1,634,795 | 9 | 4.12 |
| 11 | Diseases of the digestive system | K00-K93 | 31 | 222,553 | 1,557,872 | 9 | 4.05 |
| 12 | Diseases of the skin and subcutaneous tissue | L00-L99 | 34 | 214,802 | 1,503,615 | 7 | 5.42 |
| 13 | Diseases of the musculoskeletal system and connective tissue | M00-M99 | 13 | 11,741 | 82,188 | 6 | 6.66 |
| 14 | Diseases of the genitourinary system | N00-N99 | 28 | 236,452 | 1,655,165 | 9 | 4.14 |
| 14a | Diseases of the genitourinary system: urinary system | N00-N39 | 20 | 35,528 | 248,697 | 10 | 3.88 |
| 14b | Diseases of the genitourinary system: pelvis, genitals and breasts | N40-N99 | 25 | 236,445 | 1,655,115 | 9 | 4.14 |
| 15 | Pregnancy, childbirth and the puerperium | O00-O99 | 11 | 148,254 | 1,037,778 | 5 | 5.29 |
| 16 | Certain conditions originating in the perinatal period | P00-P96 | 18 | 179,875 | 1,259,125 | 5 | 5.59 |
| 17 | Congenital malformations, deformations, chromosomal abnormalities | Q00-Q99 | 42 | 233,541 | 1,634,787 | 9 | 4.12 |
| 18 | Symptoms, signs and abnormal cl. and laboratory findings, nec | R00-R99 | 30 | 233,540 | 1,634,782 | 9 | 4.12 |
| Total Releases | | | 48 | 241,259 | 1,688,814 | 9 | 4.20 |

4.2. Algonquin Gas Stony Point Compressor Station (Stony Point, New York)

4.2a. Facility Profile

Table 4.2a.

Algonquin Gas Stony Point Compressor Station: Facility Profile

Stony Point NY

| | |
|--|--|
| Facility name, short | AGT Stony Point CS |
| Facility name, full | Algonquin Gas Stony Point Compressor Station |
| EIS Facility ID | 7952911 |
| DEC Region | 3 -- Lower Hudson Valley |
| County | Rockland |
| Town | Stony Point |
| Village \ Hamlet | |
| Address | 1 Lindberg Rd |
| Zip | 10980 |
| DEC Permit Type | Air Title V Facility |
| DEC Facility ID | 3392800001 |
| DEC Permit ID | 3-3928-00001/00027 |
| DEC Permit Effective Date | 12/21/2015 |
| Company | Algonquin Gas Transmission LLC |
| Project | Algonquin Incremental Market (AIM) |
| Pipeline | Algonquin |
| Principal Supply Source | Interstate System |
| System Configuration (Primary / Secondary) * | Trunk/Grid |
| Facility Status | Operational \ Expansion under review |
| Facility Status Dates | |
| Horsepower, existing | 12,000 |
| Horsepower, modifications\expansion | One new compressor to be added at this site. |

4.2b. Health Effects of Facility Releases

Table 4.2b.

Algonquin Gas Stony Point Compressor Station: Health Effects of Facility Releases

Stony Point NY

| International Classification of Disease, 10 th edition | | | State | Ch | 2008-14 Estimated Lbs. | | % of |
|---|--|---------|----------|-----------|------------------------|------------------|-------------|
| Ch. | Description | Code | Rank | # | Average | Total | State |
| 2 | Neoplasms | C00-D48 | 5 | 42 | 110,464 | 773,249 | 8.07 |
| 2a | Malignant neoplasms | C00-C97 | 5 | 40 | 106,763 | 747,345 | 7.95 |
| 2a.1 | Lip, oral cavity and pharynx | C00-C14 | 7 | 10 | 12,190 | 85,332 | 5.92 |
| 2a.2 | Digestive organs | C15-C26 | 7 | 30 | 12,784 | 89,492 | 6.12 |
| 2a.3 | Respiratory system and intrathoracic organs | C30-C39 | 5 | 29 | 106,158 | 743,106 | 7.93 |
| 2a.4 | Bone and articular cartilage | C40-C41 | 5 | 26 | 100,507 | 703,555 | 8.02 |
| 2a.5 | Skin | C43-C44 | 2 | 7 | 650 | 4,553 | 17.06 |
| 2a.6 | Connective and soft tissue | C45-C49 | 1 | 13 | 1,073 | 7,515 | 27.49 |
| 2a.07 | Breast and female genital organs | C50-C58 | 8 | 17 | 33,931 | 237,522 | 5.48 |
| 2a.07.50 | Female breast | C50 | 7 | 16 | 29,326 | 205,287 | 5.41 |
| 2a.07.55 | Uterus | C55 | 3 | 3 | 99 | 698 | 14.27 |
| 2a.07.56 | Ovary | C56 | 2 | 3 | 649 | 4,548 | 17.44 |
| 2a.08 | Male genital organs | C60-C63 | 6 | 10 | 9,786 | 68,506 | 5.66 |
| 2a.09 | Urinary organs | C64-C68 | 7 | 19 | 11,842 | 82,899 | 5.75 |
| 2a.10 | Eye, brain and central nervous system | C69-C72 | 7 | 16 | 12,800 | 89,604 | 6.13 |
| 2a.11 | Endocrine glands and related structures | C73-C75 | 6 | 10 | 9,756 | 68,294 | 5.59 |
| 2a.12 | Secondary and ill-defined | C76-C80 | 1 | 5 | 1,541 | 10,792 | 32.56 |
| 2a.13 | Malignant neoplasms, lymphoid, haematopoietic, related | C81-C96 | 8 | 28 | 35,662 | 249,634 | 5.69 |
| 2a.14 | Malignant neoplasms of independent (primary) multiple sites | C97 | | | | | |
| 2b | In situ neoplasms | D00-D09 | 2 | 3 | 1,444 | 10,109 | 24.19 |
| 2c | Benign neoplasms | D10-D36 | 2 | 22 | 3,270 | 22,896 | 13.84 |
| 2d | Neoplasms of uncertain or unknown behavior | D37-D48 | 7 | 30 | 12,248 | 85,739 | 5.90 |
| 3 | Diseases of the blood and blood-forming organs, immune mechanism | D50-D89 | 7 | 29 | 154,987 | 1,084,914 | 5.75 |
| 4 | Endocrine, nutritional and metabolic diseases | E00-E90 | 4 | 35 | 90,940 | 636,585 | 8.89 |
| 5 | Mental and behavioral disorders | F00-F99 | 7 | 28 | 154,887 | 1,084,215 | 5.74 |
| 6 | Diseases of the nervous system | G00-G99 | 7 | 36 | 159,633 | 1,117,432 | 5.84 |
| 7 | Diseases of the eye and adnexa | H00-H59 | 6 | 33 | 192,160 | 1,345,120 | 5.42 |
| 8 | Diseases of the ear and mastoid process | H60-H95 | 7 | 14 | 144,423 | 1,010,967 | 5.79 |
| 9 | Diseases of the circulatory system | I00-I99 | 10 | 26 | 102,539 | 717,779 | 4.42 |
| 10 | Diseases of the respiratory system | J00-J99 | 7 | 42 | 282,933 | 1,980,536 | 5.00 |
| 11 | Diseases of the digestive system | K00-K93 | 7 | 37 | 273,624 | 1,915,369 | 4.98 |
| 12 | Diseases of the skin and subcutaneous tissue | L00-L99 | 6 | 39 | 215,263 | 1,506,847 | 5.43 |
| 13 | Diseases of the musculoskeletal system and connective tissue | M00-M99 | 7 | 14 | 11,114 | 77,802 | 6.31 |
| 14 | Diseases of the genitourinary system | N00-N99 | 7 | 36 | 282,892 | 1,980,244 | 4.96 |
| 14a | Diseases of the genitourinary system: urinary system | N00-N39 | 4 | 27 | 82,163 | 575,141 | 8.97 |
| 14b | Diseases of the genitourinary system: pelvis, genitals and breasts | N40-N99 | 7 | 30 | 282,888 | 1,980,219 | 4.96 |
| 15 | Pregnancy, childbirth and the puerperium | O00-O99 | 8 | 16 | 117,277 | 820,945 | 4.18 |
| 16 | Certain conditions originating in the perinatal period | P00-P96 | 8 | 18 | 139,970 | 979,796 | 4.35 |
| 17 | Congenital malformations, deformations and chromosomal ab. | Q00-Q99 | 7 | 42 | 282,934 | 1,980,541 | 5.00 |
| 18 | Symptoms, signs and abnormal clinical, laboratory findings, nec | R00-R99 | 7 | 36 | 282,933 | 1,980,536 | 5.00 |
| Total Releases | | | 7 | 49 | 287,639 | 2,013,478 | 5.01 |

4.3. DTI E.M. Borger Compressor Station (Ithaca NY)

4.3a. Facility Profile

Table 4.3a.

DTI E.M. Borger Compressor Station

Ithaca NY

| | |
|--|---|
| Facility name, short | DTI Borger CS |
| Facility name, full | DTI E.M. Borger Compressor Station |
| EIS Facility ID | 8542411 |
| DEC Region | 7 -- Central New York |
| County | Tompkins |
| Town | Ithaca |
| Village \ Hamlet | |
| Address | 219 Ellis Hollow Creek |
| Zip | 14850 |
| DEC Permit Type | Air State Facility |
| DEC Facility ID | 7502400007 |
| DEC Permit ID | 7-5024-00007/00004 |
| DEC Permit Effective Date | 01/08/2014 |
| Company | Dominion Transportation Inc. |
| Project | New Market Project |
| Pipeline | Dominion |
| Principal Supply Source | |
| System Configuration (Primary / Secondary) * | |
| Facility Status | Operational |
| Facility Status Dates | |
| Horsepower, existing | 18,430 HP |
| Horsepower, modifications\expansion | (1) Dresser Clark DC 990 5800 HP ngfsct, (1) Dresser Clark DC 990 5800 HP ngfsct, (1) Dresser Clark DC 990 5800 HP ngfsct, (1) Solar Turbines Inc. Taurus 70-1030S HP ngfsct |

4.3b. Health Effects of Facility Releases

Table 4.2b.

DTI E.M. Borger Compressor Station: Health Effects of Facility Releases

Ithaca NY

| International Classification of Disease, 10 th edition | | | State | Ch | 2008-14 Estimated Lbs. | | % of |
|---|--|---------|-----------|-----------|------------------------|----------------|-------------|
| Ch. | Description | Code | Rank | # | Average | Total | State |
| 2 | Neoplasms | C00-D48 | 17 | 40 | 7,571 | 52,998 | 0.55 |
| 2a | Malignant neoplasms | C00-C97 | 17 | 37 | 6,881 | 48,166 | 0.51 |
| 2a.1 | Lip, oral cavity and pharynx | C00-C14 | 18 | 12 | 189 | 1,322 | 0.09 |
| 2a.2 | Digestive organs | C15-C26 | 18 | 21 | 198 | 1,389 | 0.10 |
| 2a.3 | Respiratory system and intrathoracic organs | C30-C39 | 17 | 29 | 6,875 | 48,128 | 0.51 |
| 2a.4 | Bone and articular cartilage | C40-C41 | 16 | 27 | 6,195 | 43,362 | 0.49 |
| 2a.5 | Skin | C43-C44 | 13 | 10 | 2 | 16 | 0.06 |
| 2a.6 | Connective and soft tissue | C45-C49 | 13 | 12 | 30 | 211 | 0.77 |
| 2a.07 | Breast and female genital organs | C50-C58 | 18 | 14 | 3,040 | 21,283 | 0.49 |
| 2a.07.50 | Female breast | C50 | 18 | 12 | 2,361 | 16,525 | 0.44 |
| 2a.07.55 | Uterus | C55 | 11 | 3 | 0 | 1 | 0.01 |
| 2a.07.56 | Ovary | C56 | 13 | 3 | 2 | 16 | 0.06 |
| 2a.08 | Male genital organs | C60-C63 | 18 | 7 | 153 | 1,070 | 0.08 |
| 2a.09 | Urinary organs | C64-C68 | 18 | 15 | 175 | 1,227 | 0.09 |
| 2a.10 | Eye, brain and central nervous system | C69-C72 | 18 | 12 | 191 | 1,338 | 0.09 |
| 2a.11 | Endocrine glands and related structures | C73-C75 | 18 | 6 | 142 | 997 | 0.07 |
| 2a.12 | Secondary and ill-defined | C76-C80 | 13 | 6 | 43 | 300 | 0.90 |
| 2a.13 | Stated or presumed to be primary, of lymphoid, haematopoietic, related | C81-C96 | 18 | 19 | 3,079 | 21,553 | 0.49 |
| 2a.14 | Neoplasms of independent (primary) multiple sites | C97 | 0 | 0 | 0 | 0 | 0.00 |
| 2b | In situ neoplasms | D00-D09 | 13 | 2 | 27 | 188 | 0.45 |
| 2c | Benign neoplasms | D10-D36 | 13 | 15 | 27 | 187 | 0.11 |
| 2d | Neoplasms of uncertain or unknown behavior | D37-D48 | 18 | 26 | 186 | 1,305 | 0.09 |
| 3 | Diseases of the blood, blood-forming organs, immune mechanism | D50-D89 | 17 | 22 | 21,652 | 151,564 | 0.80 |
| 4 | Endocrine, nutritional and metabolic diseases | E00-E90 | 17 | 36 | 5,354 | 37,476 | 0.52 |
| 5 | Mental and behavioral disorders | F00-F99 | 17 | 20 | 21,652 | 151,563 | 0.80 |
| 6 | Diseases of the nervous system | G00-G99 | 17 | 24 | 22,343 | 156,404 | 0.82 |
| 7 | Diseases of the eye and adnexa | H00-H59 | 11 | 25 | 90,898 | 636,288 | 2.56 |
| 8 | Diseases of the ear and mastoid process | H60-H95 | 16 | 12 | 21,502 | 150,516 | 0.86 |
| 9 | Diseases of the circulatory system | I00-I99 | 16 | 19 | 20,045 | 140,315 | 0.86 |
| 10 | Diseases of the respiratory system | J00-J99 | 14 | 33 | 110,772 | 775,401 | 1.96 |
| 11 | Diseases of the digestive system | K00-K93 | 14 | 29 | 110,016 | 770,114 | 2.00 |
| 12 | Diseases of the skin and subcutaneous tissue | L00-L99 | 11 | 33 | 93,789 | 656,521 | 2.37 |
| 13 | Diseases of the musculoskeletal system and connective tissue | M00-M99 | 18 | 12 | 798 | 5,584 | 0.45 |
| 14 | Diseases of the genitourinary system | N00-N99 | 14 | 26 | 110,760 | 775,319 | 1.94 |
| 14a | Diseases of the genitourinary system: urinary system | N00-N39 | 16 | 18 | 3,987 | 27,909 | 0.44 |
| 14b | Diseases of the genitourinary system: pelvis, genitals and breasts | N40-N99 | 14 | 23 | 110,758 | 775,306 | 1.94 |
| 15 | Pregnancy, childbirth and the puerperium | O00-O99 | 10 | 11 | 86,398 | 604,785 | 3.08 |
| 16 | Certain conditions originating in the perinatal period | P00-P96 | 10 | 16 | 89,289 | 625,024 | 2.78 |
| 17 | Congenital malformations, deformations, chromosomal abnormalities | Q00-Q99 | 14 | 41 | 110,770 | 775,390 | 1.96 |
| 18 | Symptoms, signs and abnormal clinical and laboratory findings, nec | R00-R99 | 14 | 28 | 110,772 | 775,401 | 1.96 |
| Total Releases | | | 14 | 47 | 111,451 | 780,159 | 1.94 |

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4.4. DTI Utica Station (Frankfurt NY)

4.4a. Facility Profile

Table 4.4a.

DTI Utica Station

Frankfurt NY

| | |
|--|--|
| Facility name, short | DTI Utica Station |
| Facility name, full | DTI Utica Station |
| EIS Facility ID | 8035211 |
| DEC Region | 6 -- Western Adirondacks/Eastern Lake Ontario |
| County | Herkimer |
| Town | Frankfort |
| Village \ Hamlet | |
| Address | 1103 Higby Rd |
| Zip | 13340 |
| DEC Permit Type | Air Title V Facility |
| DEC Facility ID | 6212600037 |
| DEC Permit ID | 6-2126-00037/00025 |
| DEC Permit Effective Date | 5/25/2016 |
| DEC Permit Description | Application for renewal of Air Title V Facility. |
| DEC Permit Review Report | |
| Company | Dominion Transmission Inc. |
| Project | New Market Project |
| Pipeline | Dominion |
| Principal Supply Source | |
| System Configuration (Primary/Secondary) | |
| Status | Operational |
| Horsepower, existing | 5,550 |
| | (5) 1,100 hp Cooper Bessemer GMVC-6 compressor units |

4.4b. Health Effects of Facility Releases

Table 4.2b.

DTI Utica Station: Health Effects of Facility Releases

Frankfurt NY

| International Classification of Disease, 10 th edition | | | State | Ch | 2008-14 Estimated Lbs. | | % of |
|---|---|---------|-----------|-----------|------------------------|----------------|-------------|
| Ch. | Description | Code | Rank | # | Average | Total | State |
| 2 | Neoplasms | C00-D48 | 15 | 51 | 12,696 | 88,873 | 0.93 |
| 2a | Malignant neoplasms | C00-C97 | 15 | 48 | 12,660 | 88,622 | 0.94 |
| 2a.1 | Lip, oral cavity and pharynx | C00-C14 | 15 | 13 | 2,295 | 16,063 | 1.12 |
| 2a.2 | Digestive organs | C15-C26 | 15 | 30 | 2,356 | 16,491 | 1.13 |
| 2a.3 | Respiratory system and intrathoracic organs | C30-C39 | 15 | 34 | 12,589 | 88,120 | 0.94 |
| 2a.4 | Bone and articular cartilage | C40-C41 | 15 | 31 | 11,862 | 83,035 | 0.95 |
| 2a.5 | Skin | C43-C44 | 6 | 13 | 95 | 665 | 2.49 |
| 2a.6 | Connective and soft tissue | C45-C49 | 11 | 14 | 61 | 427 | 1.56 |
| 2a.07 | Breast and female genital organs | C50-C58 | 16 | 19 | 4,537 | 31,755 | 0.73 |
| 2a.07.50 | Female breast | C50 | 16 | 17 | 4,098 | 28,687 | 0.76 |
| 2a.07.55 | Uterus | C55 | 6 | 3 | 27 | 189 | 3.86 |
| 2a.07.56 | Ovary | C56 | 6 | 3 | 94 | 660 | 2.53 |
| 2a.08 | Male genital organs | C60-C63 | 15 | 11 | 1,947 | 13,631 | 0.97 |
| 2a.09 | Urinary organs | C64-C68 | 15 | 22 | 2,324 | 16,269 | 1.13 |
| 2a.10 | Eye, brain and central nervous system | C69-C72 | 15 | 18 | 2,367 | 16,568 | 1.13 |
| 2a.11 | Endocrine glands and related structures | C73-C75 | 15 | 9 | 2,003 | 14,019 | 0.99 |
| 2a.12 | Secondary and ill-defined | C76-C80 | 12 | 6 | 44 | 306 | 0.92 |
| 2a.13 | Stated or presumed to be primary, of lymphoid, haematopoietic, related | C81-C96 | 16 | 27 | 4,637 | 32,462 | 0.74 |
| 2a.14 | Independent (primary) multiple sites | C97 | 0 | 0 | 0 | 0 | 0 |
| 2b | In situ neoplasms | D00-D09 | 7 | 3 | 100 | 702 | 1.68 |
| 2c | Benign neoplasms | D10-D36 | 9 | 20 | 669 | 4,682 | 2.83 |
| 2d | Neoplasms of uncertain or unknown behavior | D37-D48 | 15 | 35 | 2,347 | 16,430 | 1.13 |
| 3 | Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism | D50-D89 | 16 | 31 | 22,270 | 155,891 | 0.83 |
| 4 | Endocrine, nutritional and metabolic diseases | E00-E90 | 15 | 45 | 10,601 | 74,209 | 1.04 |
| 5 | Mental and behavioral disorders | F00-F99 | 16 | 30 | 22,243 | 155,702 | 0.83 |
| 6 | Diseases of the nervous system | G00-G99 | 16 | 35 | 22,575 | 158,022 | 0.83 |
| 7 | Diseases of the eye and adnexa | H00-H59 | 17 | 34 | 25,770 | 180,386 | 0.73 |
| 8 | Diseases of the ear and mastoid process | H60-H95 | 17 | 15 | 20,007 | 140,049 | 0.80 |
| 9 | Diseases of the circulatory system | I00-I99 | 17 | 26 | 16,299 | 114,095 | 0.70 |
| 10 | Diseases of the respiratory system | J00-J99 | 17 | 43 | 39,738 | 278,165 | 0.70 |
| 11 | Diseases of the digestive system | K00-K93 | 17 | 40 | 38,557 | 269,901 | 0.70 |
| 12 | Diseases of the skin and subcutaneous tissue | L00-L99 | 17 | 44 | 28,034 | 196,235 | 0.71 |
| 13 | Diseases of the musculoskeletal system and connective tissue | M00-M99 | 16 | 15 | 1,140 | 7,977 | 0.65 |
| 14 | Diseases of the genitourinary system | N00-N99 | 17 | 37 | 39,872 | 279,102 | 0.70 |
| 14a | Diseases of the genitourinary system: urinary system | N00-N39 | 15 | 28 | 10,060 | 70,421 | 1.10 |
| 14b | Diseases of the genitourinary system: pelvis, genitals and breasts | N40-N99 | 17 | 31 | 39,864 | 279,049 | 0.70 |
| 15 | Pregnancy, childbirth and the puerperium | O00-O99 | 18 | 16 | 17,827 | 124,788 | 0.64 |
| 16 | Certain conditions originating in the perinatal period | P00-P96 | 18 | 20 | 19,886 | 139,202 | 0.62 |
| 17 | Congenital malformations, deformations and chromosomal abnormalities | Q00-Q99 | 17 | 52 | 39,732 | 278,121 | 0.70 |
| 18 | Symptoms, signs and abnormal clinical and laboratory findings, nec | R00-R99 | 17 | 38 | 39,738 | 278,165 | 0.70 |
| Total Releases | | | 17 | 59 | 40,196 | 281,369 | 0.70 |

4.5. DTI Woodhull Station (Woodhull NY)

4.5a. Facility Profile

Table 4.5a.

DTI Woodhull Station

Woodhull NY

| | |
|--|--|
| Facility name, short | DTI Woodhull Station |
| Facility name, full | DTI Woodhull Station |
| EIS Facility ID | 8437611 |
| DEC Region | 8 |
| County | Steuben |
| Town | Woodhull |
| Village \ Hamlet | |
| Address | 974 Co Rte 99 |
| Zip | 14898 |
| DEC Permit Type | Air Title V Facility |
| DEC Facility ID | 468200006 |
| DEC Permit ID | 8-4682-00006/00034 |
| DEC Permit Effective Date | 7/10/2014 |
| DEC Permit Description | Title V Facility Permit renewal |
| DEC Permit Review Report | |
| Company | Dominion Transmission Inc. |
| Project | New Market Project |
| Pipeline | Dominion |
| Principal Supply Source | |
| System Configuration (Primary/Secondary) | |
| Status | Operational |
| Horsepower, existing | 14,700 HP |
| | (5) 2,000 HP reciprocating ngfce (2) 1,800 HP reciprocating ngfce (1) 1,100 HP reciprocating ngfce |

4.5b. Health Effects of Facility Releases

Table 4.2b.

DTI Woodhull Station: Health Effects of Facility Releases

Woodhull NY

| International Classification of Disease, 10 th edition | | | State | Ch | 2008-14 Estimated Lbs. | | % of |
|---|---|---------|-----------|-----------|------------------------|----------------|-------------|
| Ch. | Description | Code | Rank | # | Average | Total | State |
| 2 | Neoplasms | C00-D48 | 11 | 53 | 47,086 | 329,602 | 3.44 |
| 2a | Malignant neoplasms | C00-C97 | 11 | 50 | 47,013 | 329,091 | 3.50 |
| 2a.1 | Lip, oral cavity and pharynx | C00-C14 | 9 | 13 | 9,688 | 67,813 | 4.71 |
| 2a.2 | Digestive organs | C15-C26 | 9 | 32 | 10,400 | 72,801 | 4.98 |
| 2a.3 | Respiratory system and intrathoracic organs | C30-C39 | 11 | 35 | 46,203 | 323,418 | 3.45 |
| 2a.4 | Bone and articular cartilage | C40-C41 | 11 | 32 | 43,265 | 302,854 | 3.45 |
| 2a.5 | Skin | C43-C44 | 3 | 13 | 412 | 2,883 | 10.80 |
| 2a.6 | Connective and soft tissue | C45-C49 | 5 | 15 | 276 | 1,929 | 7.06 |
| 2a.07 | Breast and female genital organs | C50-C58 | 10 | 20 | 18,612 | 130,284 | 3.00 |
| 2a.07.50 | Female breast | C50 | 10 | 18 | 16,924 | 118,465 | 3.12 |
| 2a.07.55 | Uterus | C55 | 2 | 3 | 119 | 835 | 17.06 |
| 2a.07.56 | Ovary | C56 | 3 | 3 | 402 | 2,811 | 10.78 |
| 2a.08 | Male genital organs | C60-C63 | 10 | 11 | 8,216 | 57,511 | 4.11 |
| 2a.09 | Urinary organs | C64-C68 | 9 | 23 | 9,842 | 68,892 | 4.78 |
| 2a.10 | Eye, brain and central nervous system | C69-C72 | 9 | 18 | 10,419 | 72,931 | 4.99 |
| 2a.11 | Endocrine glands and related structures | C73-C75 | 10 | 10 | 8,441 | 59,084 | 4.19 |
| 2a.12 | Secondary and ill-defined | C76-C80 | 5 | 6 | 201 | 1,404 | 4.22 |
| 2a.13 | Stated or presumed to be primary, of lymphoid, haematopoietic, related | C81-C96 | 10 | 28 | 19,186 | 134,302 | 3.06 |
| 2a.14 | Independent (primary) multiple sites | C97 | 0 | 0 | 0 | 0 | 0 |
| 2b | In situ neoplasms | D00-D09 | 4 | 3 | 431 | 3,015 | 7.22 |
| 2c | Benign neoplasms | D10-D36 | 3 | 22 | 3,270 | 22,892 | 13.84 |
| 2d | Neoplasms of uncertain or unknown behavior | D37-D48 | 9 | 36 | 10,353 | 72,472 | 4.98 |
| 3 | Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism | D50-D89 | 12 | 32 | 86,683 | 606,778 | 3.21 |
| 4 | Endocrine, nutritional and metabolic diseases | E00-E90 | 11 | 46 | 38,601 | 270,204 | 3.77 |
| 5 | Mental and behavioral disorders | F00-F99 | 12 | 31 | 86,571 | 605,996 | 3.21 |
| 6 | Diseases of the nervous system | G00-G99 | 12 | 37 | 87,890 | 615,229 | 3.22 |
| 7 | Diseases of the eye and adnexa | H00-H59 | 14 | 36 | 59,457 | 416,201 | 1.68 |
| 8 | Diseases of the ear and mastoid process | H60-H95 | 12 | 15 | 77,004 | 539,026 | 3.09 |
| 9 | Diseases of the circulatory system | I00-I99 | 12 | 27 | 67,558 | 472,907 | 2.91 |
| 10 | Diseases of the respiratory system | J00-J99 | 13 | 45 | 116,642 | 816,492 | 2.06 |
| 11 | Diseases of the digestive system | K00-K93 | 13 | 42 | 111,868 | 783,072 | 2.04 |
| 12 | Diseases of the skin and subcutaneous tissue | L00-L99 | 14 | 46 | 68,499 | 479,496 | 1.73 |
| 13 | Diseases of the musculoskeletal system and connective tissue | M00-M99 | 10 | 16 | 5,165 | 36,154 | 2.93 |
| 14 | Diseases of the genitourinary system | N00-N99 | 13 | 39 | 117,138 | 819,966 | 2.05 |
| 14a | Diseases of the genitourinary system: urinary system | N00-N39 | 8 | 30 | 36,570 | 255,987 | 3.99 |
| 14b | Diseases of the genitourinary system: pelvis, genitals and breasts | N40-N99 | 13 | 33 | 117,052 | 819,363 | 2.05 |
| 15 | Pregnancy, childbirth and the puerperium | O00-O99 | 16 | 16 | 31,911 | 223,376 | 1.14 |
| 16 | Certain conditions originating in the perinatal period | P00-P96 | 15 | 20 | 40,063 | 280,440 | 1.25 |
| 17 | Congenital malformations, deformations and chromosomal abnormalities | Q00-Q99 | 13 | 54 | 116,594 | 816,160 | 2.06 |
| 18 | Symptoms, signs and abnormal clinical and laboratory findings, nec | R00-R99 | 13 | 40 | 116,642 | 816,492 | 2.06 |
| Total Releases | | | 13 | 61 | 118,460 | 829,223 | 2.06 |

4.6. NFGSC Beech Hill Compressor Station (Willing NY)

4.6a. Facility Profile

Table 4.6a.

NFGSC Beech Hill Compressor Station

Willing NY

| | |
|--|--|
| Facility name, short | NFGSC Beech Hill CS |
| Facility name, full | NFGSC Beech Hill Compressor Station |
| EIS Facility ID | 8377711 |
| DEC Region | 9 |
| County | Allegany |
| Town | Willing |
| Village \ Hamlet | |
| Address | 1161 Peet Rd |
| Zip | 14895 |
| DEC Permit Type | Air Title V Facility |
| DEC Facility ID | 9027400004 |
| DEC Permit ID | 9-0274-00004/00015 |
| DEC Permit Effective Date | 4/8/2013 |
| DEC Permit Description | |
| DEC Permit Review Report | |
| Company | National Fuel Gas Supply Corp. |
| Project | Part of the Niagara Expansion Project and the Northern Access 2015 Project which are joint projects undertaken by National Fuel Gas Supply Corporation and Tennessee Gas Pipeline Company. |
| Pipeline | Empire (AKA "National Fuel") |
| Principal Supply Source | |
| System Configuration (Primary/Secondary) | |
| Status | Operational |
| Horsepower, existing | 8,350 HP |
| | (2) 2,750 HP reciprocating ngfce (1) 2,850 HP reciprocating ngfce |
| Total estimated releases (2008-2014): pounds | |
| Total estimated releases (2008-2014): rank | |

4.6b. Health Effects of Facility Releases

Table 4.6b.

NFGSC Beech Hill Compressor Station: Health Effects of Facility Releases

Willing NY

| International Classification of Disease, 10 th edition | | | State | Ch | 2008-14 Estimated Lbs. | | % of |
|---|---|---------|-----------|-----------|------------------------|------------------|-------------|
| Ch. | Description | Code | Rank | # | Average | Total | State |
| 2 | Neoplasms | C00-D48 | 13 | 19 | 37,053 | 259,370 | 2.71 |
| 2a | Malignant neoplasms | C00-C97 | 13 | 18 | 36,733 | 257,128 | 2.74 |
| 2a.1 | Lip, oral cavity and pharynx | C00-C14 | 11 | 7 | 7,182 | 50,270 | 3.49 |
| 2a.2 | Digestive organs | C15-C26 | 11 | 13 | 7,184 | 50,287 | 3.44 |
| 2a.3 | Respiratory system and intrathoracic organs | C30-C39 | 13 | 15 | 36,636 | 256,453 | 2.74 |
| 2a.4 | Bone and articular cartilage | C40-C41 | 13 | 13 | 34,633 | 242,427 | 2.77 |
| 2a.5 | Skin | C43-C44 | 14 | 2 | 1 | 7 | 0.03 |
| 2a.6 | Connective and soft tissue | C45-C49 | 15 | 4 | 12 | 80 | 0.30 |
| 2a.07 | Breast and female genital organs | C50-C58 | 11 | 9 | 17,440 | 122,076 | 2.82 |
| 2a.07.50 | Female breast | C50 | 12 | 8 | 15,436 | 108,053 | 2.85 |
| 2a.07.55 | Uterus | C55 | 12 | 1 | 0 | 0 | 0.00 |
| 2a.07.56 | Ovary | C56 | 14 | 2 | 1 | 7 | 0.03 |
| 2a.08 | Male genital organs | C60-C63 | 11 | 4 | 7,072 | 49,504 | 3.54 |
| 2a.09 | Urinary organs | C64-C68 | 11 | 8 | 7,081 | 49,564 | 3.44 |
| 2a.10 | Eye, brain and central nervous system | C69-C72 | 11 | 10 | 7,086 | 49,599 | 3.39 |
| 2a.11 | Endocrine glands and related structures | C73-C75 | 11 | 4 | 7,068 | 49,476 | 3.51 |
| 2a.12 | Secondary and ill-defined | C76-C80 | 15 | 3 | 17 | 115 | 0.35 |
| 2a.13 | Stated or presumed to be primary, of lymphoid, haematopoietic, related | C81-C96 | 12 | 13 | 17,550 | 122,849 | 2.80 |
| 2a.14 | Independent (primary) multiple sites | C97 | 0 | 0 | 0 | 0 | 0 |
| 2b | In situ neoplasms | D00-D09 | 14 | 2 | 10 | 72 | 0.17 |
| 2c | Benign neoplasms | D10-D36 | 16 | 9 | 9 | 64 | 0.04 |
| 2d | Neoplasms of uncertain or unknown behavior | D37-D48 | 11 | 12 | 7,179 | 50,255 | 3.46 |
| 3 | Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism | D50-D89 | 9 | 15 | 140,703 | 984,922 | 5.22 |
| 4 | Endocrine, nutritional and metabolic diseases | E00-E90 | 13 | 15 | 28,685 | 200,796 | 2.80 |
| 5 | Mental and behavioral disorders | F00-F99 | 9 | 14 | 140,703 | 984,921 | 5.22 |
| 6 | Diseases of the nervous system | G00-G99 | 9 | 17 | 141,024 | 987,167 | 5.16 |
| 7 | Diseases of the eye and adnexa | H00-H59 | 13 | 17 | 73,519 | 514,635 | 2.07 |
| 8 | Diseases of the ear and mastoid process | H60-H95 | 9 | 9 | 133,537 | 934,758 | 5.35 |
| 9 | Diseases of the circulatory system | I00-I99 | 8 | 13 | 129,878 | 909,148 | 5.59 |
| 10 | Diseases of the respiratory system | J00-J99 | 10 | 20 | 196,224 | 1,373,569 | 3.46 |
| 11 | Diseases of the digestive system | K00-K93 | 10 | 18 | 192,242 | 1,345,694 | 3.50 |
| 12 | Diseases of the skin and subcutaneous tissue | L00-L99 | 13 | 20 | 83,888 | 587,215 | 2.12 |
| 13 | Diseases of the musculoskeletal system and connective tissue | M00-M99 | 11 | 10 | 4,093 | 28,650 | 2.32 |
| 14 | Diseases of the genitourinary system | N00-N99 | 10 | 19 | 197,907 | 1,385,347 | 3.47 |
| 14a | Diseases of the genitourinary system: urinary system | N00-N39 | 13 | 13 | 26,363 | 184,538 | 2.88 |
| 14b | Diseases of the genitourinary system: pelvis, genitals and breasts | N40-N99 | 10 | 17 | 197,810 | 1,384,673 | 3.47 |
| 15 | Pregnancy, childbirth and the puerperium | O00-O99 | 12 | 9 | 53,918 | 377,422 | 1.92 |
| 16 | Certain conditions originating in the perinatal period | P00-P96 | 12 | 10 | 64,287 | 450,005 | 2.00 |
| 17 | Congenital malformations, deformations and chromosomal abnormalities | Q00-Q99 | 10 | 19 | 196,128 | 1,372,896 | 3.46 |
| 18 | Symptoms, signs and abnormal clinical and laboratory findings, nec | R00-R99 | 10 | 20 | 196,224 | 1,373,569 | 3.46 |
| Total Releases | | | 10 | 21 | 198,227 | 1,387,592 | 3.45 |

4.7. NFGSC Concord Compressor Station (Concord NY)

4.7a. Facility Profile

Table 4.7a.

NFGSC Concord Compressor Station

Concord NY

| | |
|--|--|
| Facility name, short | NFGSC Concord Compressor Station |
| Facility name, full | NFGSC Concord CS |
| EIS Facility ID | 8503411 |
| DEC Region | 9 |
| County | Erie |
| Town | Concord |
| Village \ Hamlet | Springville |
| Address | 5510 Genesee Rd |
| Zip | 14141 |
| DEC Permit Type | Air Title V Facility |
| DEC Facility ID | 9143800044 |
| DEC Permit ID | 9-1438-00044/00014 |
| DEC Permit Effective Date | 3/31/2015 |
| DEC Permit Description | |
| DEC Permit Review Report | |
| Company | National Fuel Gas Supply Corp. |
| Project | Part of the Niagara Expansion Project and the Northern Access 2015 Project which are joint projects undertaken by National Fuel Gas Supply Corporation and Tennessee Gas Pipeline Company. |
| Pipeline | Empire (AKA "National Fuel") |
| Principal Supply Source | |
| System Configuration (Primary/Secondary) | |
| Status | |
| Horsepower, existing | |
| | |
| Total estimated releases (2008-2014): pounds | |
| Total estimated releases (2008-2014): rank | |

4.7b. Health Effects of Facility Releases

Table 4.7b.

NFGSC Concord Compressor Station: Health Effects of Facility Releases

Concord NY

| International Classification of Disease, 10 th edition | | | State | Ch | 2008-14 Estimated Lbs. | | % of |
|---|---|---------|----------|-----------|------------------------|------------------|-------------|
| Ch. | Description | Code | Rank | # | Average | Total | State |
| 2 | Neoplasms | C00-D48 | 8 | 10 | 58,379 | 408,650 | 4.26 |
| 2a | Malignant neoplasms | C00-C97 | 8 | 9 | 58,216 | 407,511 | 4.34 |
| 2a.1 | Lip, oral cavity and pharynx | C00-C14 | 5 | 3 | 18,010 | 126,066 | 8.75 |
| 2a.2 | Digestive organs | C15-C26 | 5 | 5 | 18,010 | 126,067 | 8.62 |
| 2a.3 | Respiratory system and intrathoracic organs | C30-C39 | 8 | 7 | 58,212 | 407,482 | 4.35 |
| 2a.4 | Bone and articular cartilage | C40-C41 | 9 | 6 | 54,199 | 379,392 | 4.33 |
| 2a.5 | Skin | C43-C44 | -- | -- | 0 | 0 | 0.00 |
| 2a.6 | Connective and soft tissue | C45-C49 | 14 | 2 | 16 | 113 | 0.41 |
| 2a.07 | Breast and female genital organs | C50-C58 | 6 | 5 | 39,853 | 278,969 | 6.43 |
| 2a.07.50 | Female breast | C50 | 6 | 4 | 35,840 | 250,878 | 6.61 |
| 2a.07.55 | Uterus | C55 | -- | -- | 0 | 0 | 0.00 |
| 2a.07.56 | Ovary | C56 | -- | -- | 0 | 0 | 0.00 |
| 2a.08 | Male genital organs | C60-C63 | 2 | 1 | 26,984 | 188,888 | 13.49 |
| 2a.09 | Urinary organs | C64-C68 | 5 | 4 | 18,006 | 126,039 | 8.75 |
| 2a.10 | Eye, brain and central nervous system | C69-C72 | 5 | 4 | 18,006 | 126,039 | 8.62 |
| 2a.11 | Endocrine glands and related structures | C73-C75 | 2 | 2 | 27,008 | 189,058 | 13.40 |
| 2a.12 | Secondary and ill-defined | C76-C80 | 14 | 1 | 24 | 170 | 0.51 |
| 2a.13 | Stated or presumed to be primary, of lymphoid, haematopoietic, related | C81-C96 | 6 | 6 | 39,857 | 278,996 | 6.36 |
| 2a.14 | Independent (primary) multiple sites | C97 | -- | -- | 0 | 0 | 0.00 |
| 2b | In situ neoplasms | D00-D09 | -- | -- | 0 | 0 | 0.00 |
| 2c | Benign neoplasms | D10-D36 | 14 | 2 | 16 | 113 | 0.07 |
| 2d | Neoplasms of uncertain or unknown behavior | D37-D48 | 5 | 5 | 18,010 | 126,067 | 8.67 |
| 3 | Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism | D50-D89 | 10 | 7 | 133,625 | 935,371 | 4.96 |
| 4 | Endocrine, nutritional and metabolic diseases | E00-E90 | 10 | 7 | 40,512 | 283,584 | 3.96 |
| 5 | Mental and behavioral disorders | F00-F99 | 10 | 7 | 133,625 | 935,371 | 4.96 |
| 6 | Diseases of the nervous system | G00-G99 | 10 | 8 | 133,787 | 936,510 | 4.90 |
| 7 | Diseases of the eye and adnexa | H00-H59 | 9 | 8 | 128,461 | 899,225 | 3.62 |
| 8 | Diseases of the ear and mastoid process | H60-H95 | 10 | 4 | 115,615 | 809,305 | 4.63 |
| 9 | Diseases of the circulatory system | I00-I99 | 7 | 8 | 133,132 | 931,923 | 5.73 |
| 10 | Diseases of the respiratory system | J00-J99 | 8 | 11 | 243,583 | 1,705,081 | 4.30 |
| 11 | Diseases of the digestive system | K00-K93 | 8 | 10 | 234,664 | 1,642,645 | 4.27 |
| 12 | Diseases of the skin and subcutaneous tissue | L00-L99 | 9 | 11 | 150,324 | 1,052,268 | 3.79 |
| 13 | Diseases of the musculoskeletal system and connective tissue | M00-M99 | 8 | 4 | 8,924 | 62,464 | 5.07 |
| 14 | Diseases of the genitourinary system | N00-N99 | 8 | 11 | 247,433 | 1,732,031 | 4.34 |
| 14a | Diseases of the genitourinary system: urinary system | N00-N39 | 9 | 6 | 36,353 | 254,468 | 3.97 |
| 14b | Diseases of the genitourinary system: pelvis, genitals and breasts | N40-N99 | 8 | 10 | 247,429 | 1,732,003 | 4.34 |
| 15 | Pregnancy, childbirth and the puerperium | O00-O99 | 9 | 4 | 109,935 | 769,543 | 3.92 |
| 16 | Certain conditions originating in the perinatal period | P00-P96 | 9 | 7 | 131,814 | 922,698 | 4.10 |
| 17 | Congenital malformations, deformations and chromosomal abnormalities | Q00-Q99 | 8 | 10 | 243,579 | 1,705,053 | 4.30 |
| 18 | Symptoms, signs and abnormal clinical and laboratory findings, nec | R00-R99 | 8 | 11 | 243,583 | 1,705,081 | 4.30 |
| Total Releases | | | 8 | 12 | 247,596 | 1,733,171 | 4.31 |

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4.8. NFGSC Independence Compressor Station (Andover NY)

4.8a. Facility Profile

Table 4.8a.

NFGSC Independence Compressor Station

Andover NY

| | |
|--|--|
| Facility name, short | NFGSC Independence Compressor Station |
| Facility name, full | NFGSC Independence CS |
| EIS Facility ID | 8377611 |
| DEC Region | 9 |
| County | Allegany |
| Town | Andover |
| Village \ Hamlet | |
| Address | 2210 County Road 22 |
| Zip | 14806 |
| DEC Permit Type | Air Title V Facility |
| DEC Facility ID | 9026000009 |
| DEC Permit ID | 9-0260-00009/00016 |
| DEC Permit Effective Date | 4/9/2013 |
| DEC Permit Description | |
| DEC Permit Review Report | |
| Company | National Fuel Gas Supply Corp. |
| Project | Part of the Niagara Expansion Project and the Northern Access 2015 Project which are joint projects undertaken by National Fuel Gas Supply Corporation and Tennessee Gas Pipeline Company. |
| Pipeline | Empire (AKA "National Fuel") |
| Principal Supply Source | |
| System Configuration (Primary/Secondary) | |
| Status | Operational |
| Horsepower, existing | 5,000 |
| | (2) 1,000 HP reciprocating ngfce (2) 1,500 HP reciprocating ngfce |
| Total estimated releases (2008-2014): pounds | |
| Total estimated releases (2008-2014): rank | |

4.8b. Health Effects of Facility Releases

Table 4.8b.

NFGSC Independence Compressor Station: Facility Releases by Health Effects (2008-2014)

Andover NY

| International Classification of Disease, 10 th edition | | | State Rank | Ch # | 2008-14 Estimated Lbs. | | % of State |
|---|---|---------|------------|-----------|------------------------|------------------|-------------|
| Chapter | Description | Code | | | Average | Total | |
| 2 | Neoplasms | C00-D48 | 10 | 15 | 56,144 | 393,010 | 4.10 |
| 2a | Malignant neoplasms | C00-C97 | 10 | 14 | 56,041 | 392,290 | 4.17 |
| 2a.1 | Lip, oral cavity and pharynx | C00-C14 | 10 | 7 | 9,210 | 64,473 | 4.48 |
| 2a.2 | Digestive organs | C15-C26 | 10 | 10 | 9,211 | 64,477 | 4.41 |
| 2a.3 | Respiratory system and intrathoracic organs | C30-C39 | 10 | 11 | 55,997 | 391,984 | 4.19 |
| 2a.4 | Bone and articular cartilage | C40-C41 | 8 | 10 | 55,385 | 387,695 | 4.42 |
| 2a.5 | Skin | C43-C44 | 17 | 1 | 0 | 1 | 0.00 |
| 2a.6 | Connective and soft tissue | C45-C49 | 16 | 3 | 4 | 30 | 0.11 |
| 2a.07 | Breast and female genital organs | C50-C58 | 13 | 6 | 12,417 | 86,924 | 2.00 |
| 2a.07.50 | Female breast | C50 | 13 | 5 | 11,805 | 82,636 | 2.18 |
| 2a.07.55 | Uterus | C55 | -- | -- | 0 | 0 | 0.00 |
| 2a.07.56 | Ovary | C56 | 17 | 1 | 0 | 1 | 0.00 |
| 2a.08 | Male genital organs | C60-C63 | 9 | 3 | 9,162 | 64,140 | 4.58 |
| 2a.09 | Urinary organs | C64-C68 | 10 | 7 | 9,167 | 64,173 | 4.45 |
| 2a.10 | Eye, brain and central nervous system | C69-C72 | 10 | 9 | 9,168 | 64,176 | 4.39 |
| 2a.11 | Endocrine glands and related structures | C73-C75 | 9 | 3 | 9,166 | 64,168 | 4.55 |
| 2a.12 | Secondary and ill-defined | C76-C80 | 16 | 4 | 4 | 32 | 0.10 |
| 2a.13 | Stated or presumed to be primary, of lymphoid, haematopoietic, related | C81-C96 | 13 | 9 | 12,460 | 87,225 | 1.99 |
| 2a.14 | Independent (primary) multiple sites | C97 | -- | -- | 0 | 0 | 0.00 |
| 2b | In situ neoplasms | D00-D09 | 15 | 2 | .4 | 3 | 0.01 |
| 2c | Benign neoplasms | D10-D36 | 17 | 5 | 4 | 33 | 0.02 |
| 2d | Neoplasms of uncertain or unknown behavior | D37-D48 | 10 | 9 | 9,211 | 64,477 | 4.43 |
| 3 | Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism | D50-D89 | 8 | 12 | 147,748 | 1,034,238 | 5.48 |
| 4 | Endocrine, nutritional and metabolic diseases | E00-E90 | 7 | 12 | 53,498 | 374,487 | 5.23 |
| 5 | Mental and behavioral disorders | F00-F99 | 8 | 12 | 147,748 | 1,034,238 | 5.48 |
| 6 | Diseases of the nervous system | G00-G99 | 8 | 13 | 147,851 | 1,034,958 | 5.41 |
| 7 | Diseases of the eye and adnexa | H00-H59 | 10 | 13 | 95,202 | 666,418 | 2.68 |
| 8 | Diseases of the ear and mastoid process | H60-H95 | 8 | 9 | 138,538 | 969,769 | 5.55 |
| 9 | Diseases of the circulatory system | I00-I99 | 9 | 10 | 106,814 | 747,699 | 4.60 |
| 10 | Diseases of the respiratory system | J00-J99 | 11 | 16 | 192,806 | 1,349,642 | 3.40 |
| 11 | Diseases of the digestive system | K00-K93 | 11 | 15 | 191,487 | 1,340,411 | 3.48 |
| 12 | Diseases of the skin and subcutaneous tissue | L00-L99 | 10 | 16 | 98,457 | 689,200 | 2.48 |
| 13 | Diseases of the musculoskeletal system and connective tissue | M00-M99 | 15 | 8 | 1,362 | 9,540 | 0.77 |
| 14 | Diseases of the genitourinary system | N00-N99 | 11 | 16 | 193,315 | 1,353,211 | 3.39 |
| 14a | Diseases of the genitourinary system: urinary system | N00-N39 | 7 | 10 | 52,786 | 369,507 | 5.76 |
| 14b | Diseases of the genitourinary system: pelvis, genitals and breasts | N40-N99 | 11 | 15 | 193,272 | 1,352,909 | 3.39 |
| 15 | Pregnancy, childbirth and the puerperium | O00-O99 | 13 | 6 | 51,476 | 360,333 | 1.84 |
| 16 | Certain conditions originating in the perinatal period | P00-P96 | 13 | 10 | 54,734 | 383,143 | 1.70 |
| 17 | Congenital malformations, deformations and chromosomal abnormalities | Q00-Q99 | 11 | 15 | 192,762 | 1,349,340 | 3.40 |
| 18 | Symptoms, signs and abnormal clinical and laboratory findings, nec | R00-R99 | 11 | 16 | 192,806 | 1,349,642 | 3.40 |
| Total Releases | | | 11 | 17 | 193,418 | 1,353,931 | 3.37 |

4.9. NFGSC Nashville Compressor Station (Hanover NY)

4.9a. Facility Profile

Table 4.9a.

NFGSC Nashville Compressor Station

Hanover NY

| | |
|--|--|
| Facility name, short | NFGSC Nashville Compressor Station |
| Facility name, full | NFGSC Nashville CS |
| EIS Facility ID | 7806511 |
| DEC Region | 9 |
| County | Chautauqua |
| Town | Hanover |
| Village \ Hamlet | Forestville |
| Address | 11413 Allegany Rd |
| Zip | 14062 |
| DEC Permit Type | Air State Facility |
| DEC Facility ID | 9064600048 |
| DEC Permit ID | 9-0646-00048/00019 |
| DEC Permit Effective Date | 7/25/2014 |
| DEC Permit Description | Permit modification was made to correct two administrative errors |
| DEC Permit Review Report | |
| Company | National Fuel Gas Supply Corp. |
| Project | Part of the Niagara Expansion Project and the Northern Access 2015 Project which are joint projects undertaken by National Fuel Gas Supply Corporation and Tennessee Gas Pipeline Company. |
| Pipeline | Empire (AKA "National Fuel") |
| Principal Supply Source | |
| System Configuration (Primary/Secondary) | |
| Status | Operational |
| Horsepower, existing | 1,028 HP |
| | (2) 660HP, (1) 225 HP, (1) 203 HP |
| Total estimated releases (2008-2014): pounds | |
| Total estimated releases (2008-2014): rank | |

4.9b. Health Effects of Facility Releases

Table 4.9b.

NFGSC Nashville Compressor Station: Facility Releases by Health Effects (2008-2014)

Hanover NY

| International Classification of Disease, 10 th edition | | | State Rank | Ch # | 2008-14 Estimated Lbs. | | % of State |
|---|---|---------|------------|-----------|------------------------|----------------|-------------|
| Chapter | Description | Code | | | Average | Total | |
| 2 | Neoplasms | C00-D48 | 14 | 31 | 19,663 | 137,639 | 1.44 |
| 2a | Malignant neoplasms | C00-C97 | 14 | 28 | 19,592 | 137,144 | 1.46 |
| 2a.1 | Lip, oral cavity and pharynx | C00-C14 | 14 | 7 | 4,274 | 29,915 | 2.08 |
| 2a.2 | Digestive organs | C15-C26 | 14 | 16 | 4,285 | 29,993 | 2.05 |
| 2a.3 | Respiratory system and intrathoracic organs | C30-C39 | 14 | 21 | 19,553 | 136,871 | 1.46 |
| 2a.4 | Bone and articular cartilage | C40-C41 | 14 | 20 | 19,171 | 134,194 | 1.53 |
| 2a.5 | Skin | C43-C44 | 15 | 7 | 0 | 0 | 0.00 |
| 2a.6 | Connective and soft tissue | C45-C49 | 17 | 10 | 2 | 15 | 0.06 |
| 2a.07 | Breast and female genital organs | C50-C58 | 14 | 9 | 6,339 | 44,374 | 1.02 |
| 2a.07.50 | Female breast | C50 | 14 | 7 | 5,957 | 41,697 | 1.10 |
| 2a.07.55 | Uterus | C55 | 13 | 2 | 0 | 0 | 0.00 |
| 2a.07.56 | Ovary | C56 | 15 | 2 | 0 | 0 | 0.00 |
| 2a.08 | Male genital organs | C60-C63 | 14 | 4 | 4,243 | 29,704 | 2.12 |
| 2a.09 | Urinary organs | C64-C68 | 14 | 12 | 4,246 | 29,721 | 2.06 |
| 2a.10 | Eye, brain and central nervous system | C69-C72 | 14 | 8 | 4,257 | 29,798 | 2.04 |
| 2a.11 | Endocrine glands and related structures | C73-C75 | 13 | 4 | 4,246 | 29,719 | 2.11 |
| 2a.12 | Secondary and ill-defined | C76-C80 | 17 | 3 | 2 | 15 | 0.05 |
| 2a.13 | Stated or presumed to be primary, of lymphoid, haematopoietic, related | C81-C96 | 14 | 15 | 6,367 | 44,568 | 1.02 |
| 2a.14 | Independent (primary) multiple sites | C97 | -- | 0 | 0 | 0 | 0.00 |
| 2b | In situ neoplasms | D00-D09 | 16 | 2 | 0 | 0 | 0.00 |
| 2c | Benign neoplasms | D10-D36 | 15 | 10 | 13 | 92 | 0.06 |
| 2d | Neoplasms of uncertain or unknown behavior | D37-D48 | 14 | 20 | 4,285 | 29,993 | 2.06 |
| 3 | Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism | D50-D89 | 14 | 16 | 54,249 | 379,740 | 2.01 |
| 4 | Endocrine, nutritional and metabolic diseases | E00-E90 | 14 | 29 | 17,947 | 125,632 | 1.75 |
| 5 | Mental and behavioral disorders | F00-F99 | 14 | 16 | 54,249 | 379,740 | 2.01 |
| 6 | Diseases of the nervous system | G00-G99 | 14 | 18 | 54,319 | 380,235 | 1.99 |
| 7 | Diseases of the eye and adnexa | H00-H59 | 15 | 19 | 50,123 | 350,859 | 1.41 |
| 8 | Diseases of the ear and mastoid process | H60-H95 | 14 | 10 | 49,975 | 349,825 | 2.00 |
| 9 | Diseases of the circulatory system | I00-I99 | 14 | 16 | 42,750 | 299,248 | 1.84 |
| 10 | Diseases of the respiratory system | J00-J99 | 15 | 27 | 88,588 | 620,115 | 1.56 |
| 11 | Diseases of the digestive system | K00-K93 | 15 | 24 | 87,732 | 614,122 | 1.60 |
| 12 | Diseases of the skin and subcutaneous tissue | L00-L99 | 15 | 25 | 52,218 | 365,527 | 1.32 |
| 13 | Diseases of the musculoskeletal system and connective tissue | M00-M99 | 17 | 9 | 895 | 6,266 | 0.51 |
| 14 | Diseases of the genitourinary system | N00-N99 | 15 | 20 | 88,900 | 622,297 | 1.56 |
| 14a | Diseases of the genitourinary system: urinary system | N00-N39 | 14 | 13 | 17,497 | 122,476 | 1.91 |
| 14b | Diseases of the genitourinary system: pelvis, genitals and breasts | N40-N99 | 15 | 17 | 88,872 | 622,101 | 1.56 |
| 15 | Pregnancy, childbirth and the puerperium | O00-O99 | 15 | 8 | 36,799 | 257,594 | 1.31 |
| 16 | Certain conditions originating in the perinatal period | P00-P96 | 16 | 14 | 38,897 | 272,276 | 1.21 |
| 17 | Congenital malformations, deformations and chromosomal abnormalities | Q00-Q99 | 15 | 32 | 88,560 | 619,919 | 1.56 |
| 18 | Symptoms, signs and abnormal clinical and laboratory findings, nec | R00-R99 | 15 | 22 | 88,588 | 620,114 | 1.56 |
| Total Releases | | | 15 | 38 | 88,970 | 622,791 | 1.55 |

4.10. TGPC Compressor Station 224

4.10a. Facility Profile

Table 4.10a.

TGPC Compressor Station 224

Clymer NY

| | |
|--|--|
| Facility name, short | TGPC Compressor Station 224 |
| Facility name, full | TGPC CS 224 |
| EIS Facility ID | 7806411 |
| DEC Region | 9 |
| County | Chautauqua |
| Town | Clymer |
| Village \ Hamlet | |
| Address | 9766 Ravlin Hill Rd |
| Zip | 14724 |
| DEC Permit Type | Air Title V Facility |
| DEC Facility ID | 9064200016 |
| DEC Permit ID | 9-0642-00016/00017 |
| DEC Permit Effective Date | 5/21/2013 |
| DEC Permit Description | |
| DEC Permit Review Report | |
| Company | Tennessee Gas Pipeline Company |
| Project | Part of the Niagara Expansion Project by TGP/Kinder Morgan, which is related to National Fuel's Northern Access Project. |
| Pipeline | Tennessee Gas Pipeline |
| Principal Supply Source | |
| System Configuration (Primary/Secondary) | |
| Status | Operational |
| Horsepower, existing | 8,000 HP |
| | (4) 2000 HP4-cycle lean burn reciprocating engine |
| Total estimated releases (2008-2014): pounds | |
| Total estimated releases (2008-2014): rank | |

4.10b. Health Effects of Facility Releases

Table 4.10b.

TGPC Compressor Station 224: Facility Releases by Health Effects (2008-2014)

Clymer NY

| International Classification of Disease, 10 th edition | | | State | Ch | 2008-14 Estimated Lbs. | | % of |
|---|---|---------|-----------|-----------|------------------------|------------------|-------------|
| Chapter | Description | Code | Rank | # | Average | Total | State |
| 2 | Neoplasms | C00-D48 | 12 | 40 | 40,157 | 281,096 | 2.93 |
| 2a | Malignant neoplasms | C00-C97 | 12 | 37 | 39,935 | 279,548 | 2.97 |
| 2a.1 | Lip, oral cavity and pharynx | C00-C14 | 8 | 8 | 11,094 | 77,661 | 5.39 |
| 2a.2 | Digestive organs | C15-C26 | 8 | 29 | 11,454 | 80,175 | 5.48 |
| 2a.3 | Respiratory system and intrathoracic organs | C30-C39 | 12 | 25 | 39,258 | 274,805 | 2.93 |
| 2a.4 | Bone and articular cartilage | C40-C41 | 12 | 22 | 37,179 | 260,256 | 2.97 |
| 2a.5 | Skin | C43-C44 | 5 | 7 | 141 | 990 | 3.71 |
| 2a.6 | Connective and soft tissue | C45-C49 | 6 | 8 | 143 | 1,004 | 3.67 |
| 2a.07 | Breast and female genital organs | C50-C58 | 12 | 19 | 17,399 | 121,793 | 2.81 |
| 2a.07.50 | Female breast | C50 | 11 | 17 | 16,280 | 113,960 | 3.00 |
| 2a.07.55 | Uterus | C55 | 4 | 3 | 52 | 365 | 7.44 |
| 2a.07.56 | Ovary | C56 | 5 | 2 | 126 | 881 | 3.38 |
| 2a.08 | Male genital organs | C60-C63 | 8 | 9 | 9,516 | 66,614 | 4.76 |
| 2a.09 | Urinary organs | C64-C68 | 8 | 17 | 11,221 | 78,549 | 5.45 |
| 2a.10 | Eye, brain and central nervous system | C69-C72 | 8 | 18 | 11,403 | 79,821 | 5.46 |
| 2a.11 | Endocrine glands and related structures | C73-C75 | 8 | 7 | 9,565 | 66,955 | 4.75 |
| 2a.12 | Secondary and ill-defined | C76-C80 | 7 | 3 | 112 | 787 | 2.36 |
| 2a.13 | Stated or presumed to be primary, of lymphoid, haematopoietic, related | C81-C96 | 11 | 23 | 17,967 | 125,770 | 2.87 |
| 2a.14 | Independent (primary) multiple sites | C97 | -- | 0 | 0 | 0 | 0.00 |
| 2b | In situ neoplasms | D00-D09 | 6 | 3 | 155 | 1,086 | 2.60 |
| 2c | Benign neoplasms | D10-D36 | 4 | 21 | 2,829 | 19,804 | 11.97 |
| 2d | Neoplasms of uncertain or unknown behavior | D37-D48 | 8 | 28 | 11,383 | 79,684 | 5.48 |
| 3 | Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism | D50-D89 | 11 | 25 | 105,076 | 735,534 | 3.90 |
| 4 | Endocrine, nutritional and metabolic diseases | E00-E90 | 12 | 32 | 34,003 | 238,018 | 3.32 |
| 5 | Mental and behavioral disorders | F00-F99 | 11 | 27 | 105,039 | 735,270 | 3.90 |
| 6 | Diseases of the nervous system | G00-G99 | 11 | 34 | 106,266 | 743,864 | 3.89 |
| 7 | Diseases of the eye and adnexa | H00-H59 | 12 | 31 | 84,984 | 594,890 | 2.40 |
| 8 | Diseases of the ear and mastoid process | H60-H95 | 11 | 12 | 93,625 | 655,373 | 3.75 |
| 9 | Diseases of the circulatory system | I00-I99 | 11 | 23 | 88,805 | 621,634 | 3.83 |
| 10 | Diseases of the respiratory system | J00-J99 | 12 | 37 | 162,657 | 1,138,602 | 2.87 |
| 11 | Diseases of the digestive system | K00-K93 | 12 | 35 | 158,556 | 1,109,894 | 2.88 |
| 12 | Diseases of the skin and subcutaneous tissue | L00-L99 | 12 | 35 | 91,319 | 639,232 | 2.30 |
| 13 | Diseases of the musculoskeletal system and connective tissue | M00-M99 | 12 | 13 | 3,494 | 24,460 | 1.98 |
| 14 | Diseases of the genitourinary system | N00-N99 | 12 | 34 | 162,635 | 1,138,443 | 2.85 |
| 14a | Diseases of the genitourinary system: urinary system | N00-N39 | 12 | 26 | 32,594 | 228,156 | 3.56 |
| 14b | Diseases of the genitourinary system: pelvis, genitals and breasts | N40-N99 | 12 | 30 | 162,603 | 1,138,223 | 2.85 |
| 15 | Pregnancy, childbirth and the puerperium | O00-O99 | 11 | 16 | 63,140 | 441,983 | 2.25 |
| 16 | Certain conditions originating in the perinatal period | P00-P96 | 11 | 16 | 68,616 | 480,315 | 2.13 |
| 17 | Congenital malformations, deformations and chromosomal abnormalities | Q00-Q99 | 12 | 42 | 162,655 | 1,138,582 | 2.87 |
| 18 | Symptoms, signs and abnormal clinical and laboratory findings, nec | R00-R99 | 12 | 34 | 162,642 | 1,138,497 | 2.87 |
| Total Releases | | | 12 | 47 | 163,828 | 1,146,797 | 2.85 |

4.11. TGPC Compressor Station 229 & TEG Dehydration Facility (Eden NY)

4.11a. Facility Profile

Table 4.11a.

TPGC Compressor Station 229 & TEG Dehydration Facility

Eden NY

| | |
|--|--|
| Facility name, short | TPGC Compressor Station 229 & TEG Dehydration Facility |
| Facility name, full | TPGC 229 & TEG DF |
| EIS Facility ID | 8503511 |
| DEC Region | 9 |
| County | Erie |
| Town | Eden |
| Village \ Hamlet | |
| Address | 7586 East Eden Road |
| Zip | 14057 |
| DEC Permit Type | Air Title V Facility |
| DEC Facility ID | 9143800044 |
| DEC Permit ID | 9-1440-00034/00021 |
| DEC Permit Effective Date | 7/31/2013 |
| DEC Permit Description | |
| DEC Permit Review Report | |
| Company | Tennessee Gas Pipeline Company |
| Project | Part of the Niagara Expansion Project by TGP/Kinder Morgan, which is related to National Fuel's Northern Access Project. |
| Pipeline | Tennessee Gas Pipeline |
| Principal Supply Source | |
| System Configuration (Primary/Secondary) | |
| Status | Operational |
| Horsepower, existing | 9,714 |
| | |
| Total estimated releases (2008-2014): pounds | |
| Total estimated releases (2008-2014): rank | |

4.11b. Health Effects of Facility Releases

Table 4.11b.

TGPC Compressor Station 229 & TEG Dehydration: Facility Releases by Health Effects (2008-2014)

Eden NY

| International Classification of Disease, 10 th edition | | | State Rank | Ch # | 2008-14 Estimated Lbs. | | % of State |
|---|---|---------|------------|------|------------------------|-----------|------------|
| Chapter | Description | Code | | | Average | Total | |
| 2 | Neoplasms | C00-D48 | 12 | 40 | 40,157 | 281,096 | 2.93 |
| 2a | Malignant neoplasms | C00-C97 | 12 | 37 | 39,935 | 279,548 | 2.97 |
| 2a.1 | Lip, oral cavity and pharynx | C00-C14 | 8 | 8 | 11,094 | 77,661 | 5.39 |
| 2a.2 | Digestive organs | C15-C26 | 8 | 29 | 11,454 | 80,175 | 5.48 |
| 2a.3 | Respiratory system and intrathoracic organs | C30-C39 | 12 | 25 | 39,258 | 274,805 | 2.93 |
| 2a.4 | Bone and articular cartilage | C40-C41 | 12 | 22 | 37,179 | 260,256 | 2.97 |
| 2a.5 | Skin | C43-C44 | 5 | 7 | 141 | 990 | 3.71 |
| 2a.6 | Connective and soft tissue | C45-C49 | 6 | 8 | 143 | 1,004 | 3.67 |
| 2a.07 | Breast and female genital organs | C50-C58 | 12 | 19 | 17,399 | 121,793 | 2.81 |
| 2a.07.50 | Female breast | C50 | 11 | 17 | 16,280 | 113,960 | 3.00 |
| 2a.07.55 | Uterus | C55 | 4 | 3 | 52 | 365 | 7.44 |
| 2a.07.56 | Ovary | C56 | 5 | 2 | 126 | 881 | 3.38 |
| 2a.08 | Male genital organs | C60-C63 | 8 | 9 | 9,516 | 66,614 | 4.76 |
| 2a.09 | Urinary organs | C64-C68 | 8 | 17 | 11,221 | 78,549 | 5.45 |
| 2a.10 | Eye, brain and central nervous system | C69-C72 | 8 | 18 | 11,403 | 79,821 | 5.46 |
| 2a.11 | Endocrine glands and related structures | C73-C75 | 8 | 7 | 9,565 | 66,955 | 4.75 |
| 2a.12 | Secondary and ill-defined | C76-C80 | 7 | 3 | 112 | 787 | 2.36 |
| 2a.13 | Stated or presumed to be primary, of lymphoid, haematopoietic, related | C81-C96 | 11 | 23 | 17,967 | 125,770 | 2.87 |
| 2a.14 | Independent (primary) multiple sites | C97 | | | | | |
| 2b | In situ neoplasms | D00-D09 | 6 | 3 | 155 | 1,086 | 2.60 |
| 2c | Benign neoplasms | D10-D36 | 4 | 21 | 2,829 | 19,804 | 11.97 |
| 2d | Neoplasms of uncertain or unknown behavior | D37-D48 | 8 | 28 | 11,383 | 79,684 | 5.48 |
| 3 | Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism | D50-D89 | 11 | 25 | 105,076 | 735,534 | 3.90 |
| 4 | Endocrine, nutritional and metabolic diseases | E00-E90 | 12 | 32 | 34,003 | 238,018 | 3.32 |
| 5 | Mental and behavioral disorders | F00-F99 | 11 | 27 | 105,039 | 735,270 | 3.90 |
| 6 | Diseases of the nervous system | G00-G99 | 11 | 34 | 106,266 | 743,864 | 3.89 |
| 7 | Diseases of the eye and adnexa | H00-H59 | 12 | 31 | 84,984 | 594,890 | 2.40 |
| 8 | Diseases of the ear and mastoid process | H60-H95 | 11 | 12 | 93,625 | 655,373 | 3.75 |
| 9 | Diseases of the circulatory system | I00-I99 | 11 | 23 | 88,805 | 621,634 | 3.83 |
| 10 | Diseases of the respiratory system | J00-J99 | 12 | 37 | 162,657 | 1,138,602 | 2.87 |
| 11 | Diseases of the digestive system | K00-K93 | 12 | 35 | 158,556 | 1,109,894 | 2.88 |
| 12 | Diseases of the skin and subcutaneous tissue | L00-L99 | 12 | 35 | 91,319 | 639,232 | 2.30 |
| 13 | Diseases of the musculoskeletal system and connective tissue | M00-M99 | 12 | 13 | 3,494 | 24,460 | 1.98 |
| 14 | Diseases of the genitourinary system | N00-N99 | 12 | 34 | 162,635 | 1,138,443 | 2.85 |
| 14a | Diseases of the genitourinary system: urinary system | N00-N39 | 12 | 26 | 32,594 | 228,156 | 3.56 |
| 14b | Diseases of the genitourinary system: pelvis, genitals and breasts | N40-N99 | 12 | 30 | 162,603 | 1,138,223 | 2.85 |
| 15 | Pregnancy, childbirth and the puerperium | O00-O99 | 11 | 16 | 63,140 | 441,983 | 2.25 |
| 16 | Certain conditions originating in the perinatal period | P00-P96 | 11 | 16 | 68,616 | 480,315 | 2.13 |
| 17 | Congenital malformations, deformations and chromosomal abnormalities | Q00-Q99 | 12 | 42 | 162,655 | 1,138,582 | 2.87 |
| 18 | Symptoms, signs and abnormal clinical and laboratory findings, nec | R00-R99 | 12 | 34 | 162,642 | 1,138,497 | 2.87 |
| Total Releases | | | 12 | 47 | 163,828 | 1,146,797 | 2.85 |

4.12. TGPC Compressor Station 230-C (Lockport NY)

4.12a. Facility Profile

Table 4.12a.

TPGC Compressor Station 230-C

Lockport NY

| | |
|--|--|
| Facility name, short | TPGC Compressor Station 230-C |
| Facility name, full | TPGC CS 230-C |
| EIS Facility ID | 7417311 |
| DEC Region | 9 |
| County | Niagara |
| Town | Lockport |
| Village \ Hamlet | |
| Address | 5186 Lockport Junction Rd |
| Zip | 14094 |
| DEC Permit Type | Air State Facility |
| DEC Facility ID | 9292000008 |
| DEC Permit ID | 9-2920-00008/00015 |
| DEC Permit Effective Date | 12/2/2014 |
| DEC Permit Description | |
| DEC Permit Review Report | |
| Company | Tennessee Gas Pipeline Company |
| Project | Part of the Niagara Expansion Project by TGP/Kinder Morgan, which is related to National Fuel's Northern Access Project. |
| Pipeline | Tennessee Gas Pipeline |
| Principal Supply Source | |
| System Configuration (Primary/Secondary) | |
| Status | Operational |
| Horsepower, existing | 18,000 |
| | (4) 4,500 HP Solar Centaur H compressor turbines |
| Total estimated releases (2008-2014): pounds | |
| Total estimated releases (2008-2014): rank | |

4.12b. Health Effects of Facility Releases

Table 4.12b.

TGPC Compressor Station 230-C: Facility Releases by Health Effects

Lockport NY

| International Classification of Disease, 10 th edition | | | State Rank | Ch # | 2008-14 Estimated Lbs. | | % of State |
|---|---|---------|------------|-----------|------------------------|----------------|-------------|
| Chapter | Description | Code | | | Average | Total | |
| 2 | Neoplasms | C00-D48 | 16 | 23 | 9,972 | 69,806 | 0.73 |
| 2a | Malignant neoplasms | C00-C97 | 16 | 22 | 7,013 | 49,091 | 0.52 |
| 2a.1 | Lip, oral cavity and pharynx | C00-C14 | 16 | 7 | 369 | 2,580 | 0.18 |
| 2a.2 | Digestive organs | C15-C26 | 16 | 14 | 399 | 2,792 | 0.19 |
| 2a.3 | Respiratory system and intrathoracic organs | C30-C39 | 16 | 20 | 7,007 | 49,046 | 0.52 |
| 2a.4 | Bone and articular cartilage | C40-C41 | 17 | 18 | 5,958 | 41,706 | 0.48 |
| 2a.5 | Skin | C43-C44 | 11 | 3 | 5 | 36 | 0.14 |
| 2a.6 | Connective and soft tissue | C45-C49 | 7 | 8 | 112 | 783 | 2.86 |
| 2a.07 | Breast and female genital organs | C50-C58 | 15 | 11 | 5,817 | 40,722 | 0.94 |
| 2a.07.50 | Female breast | C50 | 15 | 10 | 4,771 | 33,396 | 0.88 |
| 2a.07.55 | Uterus | C55 | 10 | 2 | 2 | 16 | 0.33 |
| 2a.07.56 | Ovary | C56 | 11 | 3 | 6 | 44 | 0.17 |
| 2a.08 | Male genital organs | C60-C63 | 16 | 5 | 274 | 1,915 | 0.14 |
| 2a.09 | Urinary organs | C64-C68 | 16 | 12 | 353 | 2,469 | 0.17 |
| 2a.10 | Eye, brain and central nervous system | C69-C72 | 16 | 11 | 375 | 2,626 | 0.18 |
| 2a.11 | Endocrine glands and related structures | C73-C75 | 16 | 6 | 282 | 1,972 | 0.14 |
| 2a.12 | Secondary and ill-defined | C76-C80 | 6 | 5 | 137 | 962 | 2.89 |
| 2a.13 | Stated or presumed to be primary, of lymphoid, haematopoietic, related | C81-C96 | 15 | 16 | 5,882 | 41,174 | 0.94 |
| 2a.14 | Independent (primary) multiple sites | C97 | | | | | |
| 2b | In situ neoplasms | D00-D09 | 11 | 2 | 48 | 333 | 0.80 |
| 2c | Benign neoplasms | D10-D36 | 11 | 11 | 70 | 487 | 0.29 |
| 2d | Neoplasms of uncertain or unknown behavior | D37-D48 | 16 | 14 | 382 | 2,671 | 0.18 |
| 3 | Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism | D50-D89 | 15 | 17 | 22,498 | 157,488 | 0.83 |
| 4 | Endocrine, nutritional and metabolic diseases | E00-E90 | 16 | 20 | 5,433 | 38,028 | 0.53 |
| 5 | Mental and behavioral disorders | F00-F99 | 15 | 16 | 22,498 | 157,487 | 0.83 |
| 6 | Diseases of the nervous system | G00-G99 | 15 | 19 | 25,460 | 178,218 | 0.93 |
| 7 | Diseases of the eye and adnexa | H00-H59 | 16 | 19 | 42,774 | 299,420 | 1.21 |
| 8 | Diseases of the ear and mastoid process | H60-H95 | 15 | 10 | 22,205 | 155,432 | 0.89 |
| 9 | Diseases of the circulatory system | I00-I99 | 15 | 15 | 25,902 | 181,314 | 1.12 |
| 10 | Diseases of the respiratory system | J00-J99 | 16 | 24 | 68,325 | 478,274 | 1.21 |
| 11 | Diseases of the digestive system | K00-K93 | 16 | 21 | 66,076 | 462,535 | 1.20 |
| 12 | Diseases of the skin and subcutaneous tissue | L00-L99 | 16 | 22 | 48,326 | 338,285 | 1.22 |
| 13 | Diseases of the musculoskeletal system and connective tissue | M00-M99 | 13 | 9 | 2,305 | 16,133 | 1.31 |
| 14 | Diseases of the genitourinary system | N00-N99 | 16 | 21 | 66,406 | 464,840 | 1.16 |
| 14a | Diseases of the genitourinary system: urinary system | N00-N39 | 17 | 14 | 1,428 | 9,997 | 0.16 |
| 14b | Diseases of the genitourinary system: pelvis, genitals and breasts | N40-N99 | 16 | 20 | 66,405 | 464,837 | 1.16 |
| 15 | Pregnancy, childbirth and the puerperium | O00-O99 | 14 | 10 | 38,680 | 270,758 | 1.38 |
| 16 | Certain conditions originating in the perinatal period | P00-P96 | 14 | 14 | 44,297 | 310,080 | 1.38 |
| 17 | Congenital malformations, deformations and chromosomal abnormalities | Q00-Q99 | 16 | 24 | 68,322 | 478,255 | 1.21 |
| 18 | Symptoms, signs and abnormal clinical and laboratory findings, nec | R00-R99 | 16 | 22 | 68,321 | 478,245 | 1.21 |
| Total Releases | | | 16 | 27 | 69,373 | 485,610 | 1.21 |

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4.13. TGPC Compressor Station 233 (York NY)

4.13a. Facility Profile

Table 4.13a.

TGPC Compressor Station 233

York NY

| | |
|--|--|
| Facility name, short | TGPC Compressor Station 233 |
| Facility name, full | TGPC CS 233 |
| EIS Facility ID | 8471211 |
| DEC Region | 8 |
| County | Livingston |
| Town | York |
| Village \ Hamlet | Piffard |
| Address | 2262 Dow Rd |
| Zip | 14533 |
| DEC Permit Type | Air Title V Facility |
| DEC Facility ID | 8245200008 |
| DEC Permit ID | 8-2452-00008/00007 |
| DEC Permit Effective Date | 10/28/2015 |
| DEC Permit Description | |
| DEC Permit Review Report | |
| Company | Tennessee Gas Pipeline Company |
| Project | Part of the Niagara Expansion Project by TGP/Kinder Morgan, which is related to National Fuel's Northern Access Project. |
| Pipeline | Tennessee Gas Pipeline |
| Principal Supply Source | |
| System Configuration (Primary/Secondary) | |
| Status | Operational |
| Horsepower, existing | 9,000 (2) 4,500 HP compressor engines |
| Total estimated releases (2008-2014): pounds | |
| Total estimated releases (2008-2014): rank | |

4.13b. Health Effects of Facility Releases

Table 4.13b.

TGPC Compressor Station 233: Facility Releases by Health Effects

York NY

| International Classification of Disease, 10 th edition | | | State Rank | Ch # | 2008-14 Estimated Lbs. | | % of State |
|---|---|---------|------------|------|------------------------|---------|------------|
| Chapter | Description | Code | | | Average | Total | |
| 2 | Neoplasms | C00-D48 | 18 | 23 | 3,492 | 24,447 | 0.26 |
| 2a | Malignant neoplasms | C00-C97 | 18 | 22 | 3,395 | 23,762 | 0.25 |
| 2a.1 | Lip, oral cavity and pharynx | C00-C14 | 17 | 7 | 263 | 1,841 | 0.13 |
| 2a.2 | Digestive organs | C15-C26 | 17 | 14 | 278 | 1,945 | 0.13 |
| 2a.3 | Respiratory system and intrathoracic organs | C30-C39 | 18 | 20 | 3,391 | 23,740 | 0.25 |
| 2a.4 | Bone and articular cartilage | C40-C41 | 18 | 18 | 2,867 | 20,069 | 0.23 |
| 2a.5 | Skin | C43-C44 | 12 | 3 | 4 | 28 | 0.10 |
| 2a.6 | Connective and soft tissue | C45-C49 | 9 | 8 | 72 | 502 | 1.83 |
| 2a.07 | Breast and female genital organs | C50-C58 | 17 | 11 | 4,455 | 31,182 | 0.72 |
| 2a.07.50 | Female breast | C50 | 17 | 10 | 3,669 | 25,686 | 0.68 |
| 2a.07.55 | Uterus | C55 | 18 | 2 | | | 0.00 |
| 2a.07.56 | Ovary | C56 | 12 | 3 | 5 | 32 | 0.12 |
| 2a.08 | Male genital organs | C60-C63 | 17 | 5 | 195 | 1,363 | 0.10 |
| 2a.09 | Urinary organs | C64-C68 | 17 | 12 | 248 | 1,733 | 0.12 |
| 2a.10 | Eye, brain and central nervous system | C69-C72 | 17 | 11 | 268 | 1,874 | 0.13 |
| 2a.11 | Endocrine glands and related structures | C73-C75 | 17 | 6 | 189 | 1,320 | 0.09 |
| 2a.12 | Secondary and ill-defined | C76-C80 | 8 | 5 | 94 | 659 | 1.98 |
| 2a.13 | Stated or presumed to be primary, of lymphoid, haematopoietic, related | C81-C96 | 17 | 16 | 4,510 | 31,567 | 0.72 |
| 2a.14 | Independent (primary) multiple sites | C97 | | | | | |
| 2b | In situ neoplasms | D00-D09 | 12 | 2 | 40 | 283 | 0.68 |
| 2c | Benign neoplasms | D10-D36 | 12 | 11 | 45 | 314 | 0.19 |
| 2d | Neoplasms of uncertain or unknown behavior | D37-D48 | 17 | 14 | 263 | 1,843 | 0.13 |
| 3 | Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism | D50-D89 | 18 | 17 | 6,638 | 46,465 | 0.25 |
| 4 | Endocrine, nutritional and metabolic diseases | E00-E90 | 18 | 20 | 1,159 | 8,114 | 0.11 |
| 5 | Mental and behavioral disorders | F00-F99 | 18 | 16 | 6,638 | 46,464 | 0.25 |
| 6 | Diseases of the nervous system | G00-G99 | 18 | 19 | 6,737 | 47,158 | 0.25 |
| 7 | Diseases of the eye and adnexa | H00-H59 | 18 | 19 | 23,203 | 162,421 | 0.65 |
| 8 | Diseases of the ear and mastoid process | H60-H95 | 18 | 10 | 6,505 | 45,534 | 0.26 |
| 9 | Diseases of the circulatory system | I00-I99 | 18 | 15 | 8,572 | 60,007 | 0.37 |
| 10 | Diseases of the respiratory system | J00-J99 | 18 | 24 | 31,616 | 221,312 | 0.56 |
| 11 | Diseases of the digestive system | K00-K93 | 18 | 21 | 30,446 | 213,124 | 0.55 |
| 12 | Diseases of the skin and subcutaneous tissue | L00-L99 | 18 | 22 | 26,048 | 182,337 | 0.66 |
| 13 | Diseases of the musculoskeletal system and connective tissue | M00-M99 | 14 | 9 | 1,802 | 12,614 | 1.02 |
| 14 | Diseases of the genitourinary system | N00-N99 | 18 | 21 | 32,039 | 224,273 | 0.56 |
| 14a | Diseases of the genitourinary system: urinary system | N00-N39 | 18 | 14 | 537 | 3,762 | 0.06 |
| 14b | Diseases of the genitourinary system: pelvis, genitals and breasts | N40-N99 | 18 | 20 | 32,039 | 224,271 | 0.56 |
| 15 | Pregnancy, childbirth and the puerperium | O00-O99 | 17 | 10 | 22,714 | 158,999 | 0.81 |
| 16 | Certain conditions originating in the perinatal period | P00-P96 | 17 | 14 | 25,582 | 179,073 | 0.80 |
| 17 | Congenital malformations, deformations and chromosomal abnormalities | Q00-Q99 | 18 | 24 | 31,615 | 221,306 | 0.56 |
| 18 | Symptoms, signs and abnormal clinical and laboratory findings, nec | R00-R99 | 18 | 22 | 31,615 | 221,303 | 0.56 |
| | Total Releases | | 18 | 27 | 32,140 | 224,978 | 0.56 |

| | | | | | | | |
|----------|---|---------|----|----|--------|---------|------|
| 2 | Neoplasms | C00-D48 | 18 | 23 | 3,492 | 24,447 | 0.26 |
| 2a | Malignant neoplasms | C00-C97 | 18 | 22 | 3,395 | 23,762 | 0.25 |
| 2a.1 | Lip, oral cavity and pharynx | C00-C14 | 17 | 7 | 263 | 1,841 | 0.13 |
| 2a.2 | Digestive organs | C15-C26 | 17 | 14 | 278 | 1,945 | 0.13 |
| 2a.3 | Respiratory system and intrathoracic organs | C30-C39 | 18 | 20 | 3,391 | 23,740 | 0.25 |
| 2a.4 | Bone and articular cartilage | C40-C41 | 18 | 18 | 2,867 | 20,069 | 0.23 |
| 2a.5 | Skin | C43-C44 | 12 | 3 | 4 | 28 | 0.10 |
| 2a.6 | Connective and soft tissue | C45-C49 | 9 | 8 | 72 | 502 | 1.83 |
| 2a.07 | Breast and female genital organs | C50-C58 | 17 | 11 | 4,455 | 31,182 | 0.72 |
| 2a.07.50 | Female breast | C50 | 17 | 10 | 3,669 | 25,686 | 0.68 |
| 2a.07.55 | Uterus | C55 | 18 | 2 | | | 0.00 |
| 2a.07.56 | Ovary | C56 | 12 | 3 | 5 | 32 | 0.12 |
| 2a.08 | Male genital organs | C60-C63 | 17 | 5 | 195 | 1,363 | 0.10 |
| 2a.09 | Urinary organs | C64-C68 | 17 | 12 | 248 | 1,733 | 0.12 |
| 2a.10 | Eye, brain and central nervous system | C69-C72 | 17 | 11 | 268 | 1,874 | 0.13 |
| 2a.11 | Endocrine glands and related structures | C73-C75 | 17 | 6 | 189 | 1,320 | 0.09 |
| 2a.12 | Secondary and ill-defined | C76-C80 | 8 | 5 | 94 | 659 | 1.98 |
| 2a.13 | Stated or presumed to be primary, of lymphoid, haematopoietic, related | C81-C96 | 17 | 16 | 4,510 | 31,567 | 0.72 |
| 2a.14 | Independent (primary) multiple sites | C97 | | | | | |
| 2b | In situ neoplasms | D00-D09 | 12 | 2 | 40 | 283 | 0.68 |
| 2c | Benign neoplasms | D10-D36 | 12 | 11 | 45 | 314 | 0.19 |
| 2d | Neoplasms of uncertain or unknown behavior | D37-D48 | 17 | 14 | 263 | 1,843 | 0.13 |
| 3 | Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism | D50-D89 | 18 | 17 | 6,638 | 46,465 | 0.25 |
| 4 | Endocrine, nutritional and metabolic diseases | E00-E90 | 18 | 20 | 1,159 | 8,114 | 0.11 |
| 5 | Mental and behavioral disorders | F00-F99 | 18 | 16 | 6,638 | 46,464 | 0.25 |
| 6 | Diseases of the nervous system | G00-G99 | 18 | 19 | 6,737 | 47,158 | 0.25 |
| 7 | Diseases of the eye and adnexa | H00-H59 | 18 | 19 | 23,203 | 162,421 | 0.65 |
| 8 | Diseases of the ear and mastoid process | H60-H95 | 18 | 10 | 6,505 | 45,534 | 0.26 |
| 9 | Diseases of the circulatory system | I00-I99 | 18 | 15 | 8,572 | 60,007 | 0.37 |
| 10 | Diseases of the respiratory system | J00-J99 | 18 | 24 | 31,616 | 221,312 | 0.56 |
| 11 | Diseases of the digestive system | K00-K93 | 18 | 21 | 30,446 | 213,124 | 0.55 |
| 12 | Diseases of the skin and subcutaneous tissue | L00-L99 | 18 | 22 | 26,048 | 182,337 | 0.66 |
| 13 | Diseases of the musculoskeletal system and connective tissue | M00-M99 | 14 | 9 | 1,802 | 12,614 | 1.02 |
| 14 | Diseases of the genitourinary system | N00-N99 | 18 | 21 | 32,039 | 224,273 | 0.56 |
| 14a | Diseases of the genitourinary system: urinary system | N00-N39 | 18 | 14 | 537 | 3,762 | 0.06 |
| 14b | Diseases of the genitourinary system: pelvis, genitals and breasts | N40-N99 | 18 | 20 | 32,039 | 224,271 | 0.56 |
| 15 | Pregnancy, childbirth and the puerperium | O00-O99 | 17 | 10 | 22,714 | 158,999 | 0.81 |
| 16 | Certain conditions originating in the perinatal period | P00-P96 | 17 | 14 | 25,582 | 179,073 | 0.80 |
| 17 | Congenital malformations, deformations and chromosomal abnormalities | Q00-Q99 | 18 | 24 | 31,615 | 221,306 | 0.56 |
| 18 | Symptoms, signs and abnormal clinical and laboratory findings, nec | R00-R99 | 18 | 22 | 31,615 | 221,303 | 0.56 |
| | Total Releases | | 18 | 27 | 32,140 | 224,978 | 0.56 |

4.14. TGPC Compressor Station 237 (Manchester, Phelps NY)

4.14a. Facility Profile

Table 4.14a.

TPGC Compressor Station 237

Manchester, Phelps NY

| | |
|--|--|
| Facility name, short | TPGC Compressor Station 237 |
| Facility name, full | TPGC CS 237 |
| EIS Facility ID | 7210411 |
| DEC Region | 8 -- Western Finger Lakes |
| County | Ontario |
| Town | Manchester, Phelps |
| Village \ Hamlet | Clifton Springs |
| Address | 2001 Archer Road |
| Zip | 14432 |
| DEC Permit Type | Air Title V Facility |
| DEC Facility ID | 323400013 |
| DEC Permit ID | 8-3234-00013/00011 |
| DEC Permit Effective Date | 6/14/2016 |
| DEC Permit Description | Renewal of the Title V Facility Permit originally issued November 23, 1999 and previously renewed October 4, 2010. |
| DEC Permit Review Report | |
| Company | Tennessee Gas Pipeline Company |
| Project | Part of the Niagara Expansion Project by TGP/Kinder Morgan, which is related to National Fuel's Northern Access Project. |
| Pipeline | Tennessee Gas Pipeline |
| Principal Supply Source | |
| System Configuration (Primary/Secondary) | |
| Status | Operational |
| Horsepower, existing | 8,000 (1) 4,000 HP reciprocating ngfce, (2) 2,000 HP reciprocating ngfce |

4.14b. Health Effects of Facility Releases

Table 4.14b.

TGPC Compressor Station 237: Facility Releases by Health Effects

Manchester, Phelps NY

| International Classification of Disease, 10 th edition | | | State Rank | Ch # | 2008-14 Estimated Lbs. | | % of State |
|---|---|---------|------------|----------|------------------------|------------------|-------------|
| Chapter | Description | Code | | | Average | Total | |
| 2 | Neoplasms | C00-D48 | 6 | 7 | 97,331 | 681,320 | 7.11 |
| 2a | Malignant neoplasms | C00-C97 | 6 | 6 | 97,146 | 680,023 | 7.24 |
| 2a.1 | Lip, oral cavity and pharynx | C00-C14 | 6 | 1 | 16,708 | 116,956 | 8.12 |
| 2a.2 | Digestive organs | C15-C26 | 6 | 2 | 16,709 | 116,964 | 8.00 |
| 2a.3 | Respiratory system and intrathoracic organs | C30-C39 | 6 | 5 | 97,145 | 680,015 | 7.26 |
| 2a.4 | Bone and articular cartilage | C40-C41 | 6 | 4 | 91,916 | 643,411 | 7.34 |
| 2a.5 | Skin | C43-C44 | -- | 0 | 0 | 0 | 0.00 |
| 2a.6 | Connective and soft tissue | C45-C49 | -- | 0 | 0 | 0 | 0.00 |
| 2a.07 | Breast and female genital organs | C50-C58 | 5 | 5 | 42,837 | 299,859 | 6.92 |
| 2a.07.50 | Female breast | C50 | 5 | 4 | 37,608 | 263,255 | 6.94 |
| 2a.07.55 | Uterus | C55 | -- | 0 | 0 | 0 | 0.00 |
| 2a.07.56 | Ovary | C56 | -- | 0 | 0 | 0 | 0.00 |
| 2a.08 | Male genital organs | C60-C63 | 6 | 1 | 16,708 | 116,956 | 8.35 |
| 2a.09 | Urinary organs | C64-C68 | 6 | 2 | 16,709 | 116,964 | 8.12 |
| 2a.10 | Eye, brain and central nervous system | C69-C72 | 6 | 2 | 16,709 | 116,964 | 8.00 |
| 2a.11 | Endocrine glands and related structures | C73-C75 | 6 | 1 | 16,708 | 116,956 | 8.29 |
| 2a.12 | Secondary and ill-defined | C76-C80 | -- | 0 | 0 | 0 | 0.00 |
| 2a.13 | Stated or presumed to be primary, of lymphoid, haematopoietic, related | C81-C96 | 5 | 4 | 42,836 | 299,851 | 6.84 |
| 2a.14 | Independent (primary) multiple sites | C97 | -- | 0 | 0 | 0 | 0.00 |
| 2b | In situ neoplasms | D00-D09 | -- | 0 | 0 | 0 | 0.00 |
| 2c | Benign neoplasms | D10-D36 | -- | 0 | 0 | 0 | 0.00 |
| 2d | Neoplasms of uncertain or unknown behavior | D37-D48 | 6 | 2 | 16,709 | 116,964 | 8.05 |
| 3 | Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism | D50-D89 | 5 | 4 | 195,395 | 1,367,764 | 7.25 |
| 4 | Endocrine, nutritional and metabolic diseases | E00-E90 | 6 | 5 | 76,433 | 535,029 | 7.47 |
| 5 | Mental and behavioral disorders | F00-F99 | 5 | 4 | 195,395 | 1,367,764 | 7.25 |
| 6 | Diseases of the nervous system | G00-G99 | 5 | 5 | 195,580 | 1,369,061 | 7.16 |
| 7 | Diseases of the eye and adnexa | H00-H59 | 8 | 5 | 177,838 | 1,244,864 | 5.01 |
| 8 | Diseases of the ear and mastoid process | H60-H95 | 5 | 3 | 178,687 | 1,250,808 | 7.16 |
| 9 | Diseases of the circulatory system | I00-I99 | 5 | 5 | 161,984 | 1,133,891 | 6.98 |
| 10 | Diseases of the respiratory system | J00-J99 | 6 | 8 | 323,113 | 2,261,791 | 5.70 |
| 11 | Diseases of the digestive system | K00-K93 | 6 | 7 | 313,810 | 2,196,672 | 5.71 |
| 12 | Diseases of the skin and subcutaneous tissue | L00-L99 | 8 | 8 | 203,966 | 1,427,759 | 5.15 |
| 13 | Diseases of the musculoskeletal system and connective tissue | M00-M99 | 5 | 2 | 13,956 | 97,690 | 7.92 |
| 14 | Diseases of the genitourinary system | N00-N99 | 6 | 8 | 328,157 | 2,297,097 | 5.75 |
| 14a | Diseases of the genitourinary system: urinary system | N00-N39 | 6 | 3 | 71,018 | 497,128 | 7.75 |
| 14b | Diseases of the genitourinary system: pelvis, genitals and breasts | N40-N99 | 6 | 8 | 328,157 | 2,297,097 | 5.75 |
| 15 | Pregnancy, childbirth and the puerperium | O00-O99 | 7 | 3 | 123,343 | 863,403 | 4.40 |
| 16 | Certain conditions originating in the perinatal period | P00-P96 | 7 | 5 | 149,470 | 1,046,290 | 4.65 |
| 17 | Congenital malformations, deformations and chromosomal abnormalities | Q00-Q99 | 6 | 8 | 323,113 | 2,261,791 | 5.71 |
| 18 | Symptoms, signs and abnormal clinical and laboratory findings, nec | R00-R99 | 6 | 8 | 323,113 | 2,261,791 | 5.70 |
| Total Releases | | | 6 | 9 | 328,342 | 2,298,394 | 5.72 |

4.15. TGPC Compressor Station 241 (LaFayette NY)

4.15a. Facility Profile

Table 4.15a.

TPGC Compressor Station 241

LaFayette NY

| | |
|--|--|
| Facility name, short | TPGC Compressor Station 241 |
| Facility name, full | TPGC CS 241 |
| EIS Facility ID | 7436111 |
| DEC Region | 7 -- Central New York |
| County | Onondaga |
| Town | LaFayette |
| Village \ Hamlet | |
| Address | 3447 Sentinel Heights Rd |
| Zip | 13084 |
| DEC Permit Type | Air Title V Facility |
| DEC Facility ID | 7313400022 |
| DEC Permit ID | 7-3134-00022/00011 |
| DEC Permit Effective Date | 1/23/2012 |
| DEC Permit Description | Title V Renewal and a modification to revise to the condition requiring that TGP comply with 6 NYCRR Part 212. |
| DEC Permit Review Report | |
| Company | Tennessee Gas Pipeline Company |
| Project | Part of the Niagara Expansion Project by TGP/Kinder Morgan, which is related to National Fuel's Northern Access Project. |
| Pipeline | Tennessee Gas Pipeline |
| Principal Supply Source | |
| System Configuration (Primary/Secondary) | |
| Status | Operational |
| Horsepower, existing | 6,800 HP |
| | |

4.15b. Health Effects of Facility Releases

Table 4.15b.

TGPC Compressor Station 241: Facility Releases by Health Effects

LaFayette NY

| International Classification of Disease, 10 th edition | | | State Rank | Ch # | 2008-14 Estimated Lbs. | | % of State |
|---|---|---------|------------|-----------|------------------------|------------------|-------------|
| Chapter | Description | Code | | | Average | Total | |
| 2 | Neoplasms | C00-D48 | 3 | 40 | 162,854 | 1,139,976 | 11.89 |
| 2a | Malignant neoplasms | C00-C97 | 3 | 37 | 159,625 | 1,117,378 | 11.89 |
| 2a.1 | Lip, oral cavity and pharynx | C00-C14 | 2 | 8 | 26,645 | 186,512 | 12.95 |
| 2a.2 | Digestive organs | C15-C26 | 2 | 29 | 26,850 | 187,951 | 12.85 |
| 2a.3 | Respiratory system and intrathoracic organs | C30-C39 | 3 | 25 | 159,204 | 1,114,430 | 11.90 |
| 2a.4 | Bone and articular cartilage | C40-C41 | 3 | 22 | 149,626 | 1,047,383 | 11.95 |
| 2a.5 | Skin | C43-C44 | 7 | 7 | 86 | 602 | 2.26 |
| 2a.6 | Connective and soft tissue | C45-C49 | 8 | 7 | 85 | 595 | 2.18 |
| 2a.07 | Breast and female genital organs | C50-C58 | 4 | 19 | 72,893 | 510,251 | 11.77 |
| 2a.07.50 | Female breast | C50 | 4 | 17 | 63,931 | 447,517 | 11.80 |
| 2a.07.55 | Uterus | C55 | 5 | 3 | 32 | 222 | 4.54 |
| 2a.07.56 | Ovary | C56 | 7 | 2 | 82 | 572 | 2.19 |
| 2a.08 | Male genital organs | C60-C63 | 3 | 10 | 25,626 | 179,381 | 12.81 |
| 2a.09 | Urinary organs | C64-C68 | 2 | 17 | 26,713 | 186,990 | 12.98 |
| 2a.10 | Eye, brain and central nervous system | C69-C72 | 2 | 17 | 26,839 | 187,876 | 12.85 |
| 2a.11 | Endocrine glands and related structures | C73-C75 | 3 | 7 | 25,649 | 179,540 | 12.72 |
| 2a.12 | Secondary and ill-defined | C76-C80 | 9 | 3 | 72 | 507 | 1.52 |
| 2a.13 | Stated or presumed to be primary, of lymphoid, haematopoietic, related | C81-C96 | 4 | 22 | 73,255 | 512,783 | 11.69 |
| 2a.14 | Independent (primary) multiple sites | C97 | -- | 0 | 0 | 0 | 0.00 |
| 2b | In situ neoplasms | D00-D09 | 8 | 3 | 99 | 690 | 1.65 |
| 2c | Benign neoplasms | D10-D36 | 5 | 20 | 1,801 | 12,605 | 7.62 |
| 2d | Neoplasms of uncertain or unknown behavior | D37-D48 | 2 | 27 | 26,809 | 187,665 | 12.91 |
| 3 | Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism | D50-D89 | 3 | 24 | 278,616 | 1,950,313 | 10.33 |
| 4 | Endocrine, nutritional and metabolic diseases | E00-E90 | 3 | 32 | 124,938 | 874,563 | 12.22 |
| 5 | Mental and behavioral disorders | F00-F99 | 3 | 26 | 278,597 | 1,950,179 | 10.33 |
| 6 | Diseases of the nervous system | G00-G99 | 3 | 33 | 282,459 | 1,977,210 | 10.34 |
| 7 | Diseases of the eye and adnexa | H00-H59 | 4 | 30 | 222,020 | 1,554,140 | 6.26 |
| 8 | Diseases of the ear and mastoid process | H60-H95 | 3 | 11 | 251,763 | 1,762,343 | 10.09 |
| 9 | Diseases of the circulatory system | I00-I99 | 3 | 22 | 229,876 | 1,609,133 | 9.90 |
| 10 | Diseases of the respiratory system | J00-J99 | 4 | 37 | 425,243 | 2,976,701 | 7.51 |
| 11 | Diseases of the digestive system | K00-K93 | 4 | 34 | 406,862 | 2,848,035 | 7.40 |
| 12 | Diseases of the skin and subcutaneous tissue | L00-L99 | 4 | 34 | 268,300 | 1,878,097 | 6.77 |
| 13 | Diseases of the musculoskeletal system and connective tissue | M00-M99 | 4 | 12 | 17,983 | 125,878 | 10.21 |
| 14 | Diseases of the genitourinary system | N00-N99 | 4 | 33 | 430,379 | 3,012,652 | 7.54 |
| 14a | Diseases of the genitourinary system: urinary system | N00-N39 | 3 | 25 | 112,696 | 788,872 | 12.30 |
| 14b | Diseases of the genitourinary system: pelvis, genitals and breasts | N40-N99 | 4 | 29 | 430,367 | 3,012,569 | 7.54 |
| 15 | Pregnancy, childbirth and the puerperium | O00-O99 | 6 | 15 | 132,651 | 928,556 | 4.73 |
| 16 | Certain conditions originating in the perinatal period | P00-P96 | 6 | 15 | 178,380 | 1,248,662 | 5.55 |
| 17 | Congenital malformations, deformations and chromosomal abnormalities | Q00-Q99 | 4 | 41 | 425,236 | 2,976,652 | 7.51 |
| 18 | Symptoms, signs and abnormal clinical and laboratory findings, nec | R00-R99 | 4 | 33 | 425,231 | 2,976,619 | 7.51 |
| Total Releases | | | 4 | 48 | 434,237 | 3,039,661 | 7.56 |

4.16. TGPC Compressor Station 245 (Winfield NY)

4.16a. Facility Profile

Table 4.16a.

TPGC Compressor Station 245

Winfield NY

| | |
|--|--|
| Facility name, short | TPGC Compressor Station 245 |
| Facility name, full | TPGC CS 245 |
| EIS Facility ID | 8035411 |
| DEC Region | 6 -- Western Adirondacks / Eastern Lake Ontario |
| County | Herkimer |
| Town | Winfield |
| Village \ Hamlet | West Winfield |
| Address | 457 Burrows Rd |
| Zip | 13491 |
| DEC Permit Type | Air Title V Facility |
| DEC Facility ID | 6215600018 |
| DEC Permit ID | 6-2156-00018/00021 |
| DEC Permit Effective Date | 4/1/2015 |
| DEC Permit Description | |
| DEC Permit Review Report | |
| Company | Tennessee Gas Pipeline Company |
| Project | Part of the Niagara Expansion Project by TGP/Kinder Morgan, which is related to National Fuel's Northern Access Project. |
| Pipeline | Tennessee Gas Pipeline |
| Principal Supply Source | |
| System Configuration (Primary/Secondary) | |
| Status | Operational |
| Horsepower, existing | 7,000 (5) 1,400 hp Worthington UTC-165, 2-Stroke Lean Burn(2SLB) compressor engine |
| Total estimated releases (2008-2014): pounds | |
| Total estimated releases (2008-2014): rank | |

4.16b. Health Effects of Facility Releases

Table 4.16b.

TGPC Compressor Station 245: Facility Releases by Health Effects

Winfield NY

| International Classification of Disease, 10 th edition | | | State Rank | Ch # | 2008-14 Estimated Lbs. | | % of State |
|---|---|---------|------------|-----------|------------------------|------------------|-------------|
| Chapter | Description | Code | | | Average | Total | |
| 2 | Neoplasms | C00-D48 | 3 | 40 | 162,854 | 1,139,976 | 11.89 |
| 2a | Malignant neoplasms | C00-C97 | 3 | 37 | 159,625 | 1,117,378 | 11.89 |
| 2a.1 | Lip, oral cavity and pharynx | C00-C14 | 2 | 8 | 26,645 | 186,512 | 12.95 |
| 2a.2 | Digestive organs | C15-C26 | 2 | 29 | 26,850 | 187,951 | 12.85 |
| 2a.3 | Respiratory system and intrathoracic organs | C30-C39 | 3 | 25 | 159,204 | 1,114,430 | 11.90 |
| 2a.4 | Bone and articular cartilage | C40-C41 | 3 | 22 | 149,626 | 1,047,383 | 11.95 |
| 2a.5 | Skin | C43-C44 | 7 | 7 | 86 | 602 | 2.26 |
| 2a.6 | Connective and soft tissue | C45-C49 | 8 | 7 | 85 | 595 | 2.18 |
| 2a.07 | Breast and female genital organs | C50-C58 | 4 | 19 | 72,893 | 510,251 | 11.77 |
| 2a.07.50 | Female breast | C50 | 4 | 17 | 63,931 | 447,517 | 11.80 |
| 2a.07.55 | Uterus | C55 | 5 | 3 | 32 | 222 | 4.54 |
| 2a.07.56 | Ovary | C56 | 7 | 2 | 82 | 572 | 2.19 |
| 2a.08 | Male genital organs | C60-C63 | 3 | 10 | 25,626 | 179,381 | 12.81 |
| 2a.09 | Urinary organs | C64-C68 | 2 | 17 | 26,713 | 186,990 | 12.98 |
| 2a.10 | Eye, brain and central nervous system | C69-C72 | 2 | 17 | 26,839 | 187,876 | 12.85 |
| 2a.11 | Endocrine glands and related structures | C73-C75 | 3 | 7 | 25,649 | 179,540 | 12.72 |
| 2a.12 | Secondary and ill-defined | C76-C80 | 9 | 3 | 72 | 507 | 1.52 |
| 2a.13 | Stated or presumed to be primary, of lymphoid, haematopoietic, related | C81-C96 | 4 | 22 | 73,255 | 512,783 | 11.69 |
| 2a.14 | Independent (primary) multiple sites | C97 | | | | | |
| 2b | In situ neoplasms | D00-D09 | 8 | 3 | 99 | 690 | 1.65 |
| 2c | Benign neoplasms | D10-D36 | 5 | 20 | 1,801 | 12,605 | 7.62 |
| 2d | Neoplasms of uncertain or unknown behavior | D37-D48 | 2 | 27 | 26,809 | 187,665 | 12.91 |
| 3 | Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism | D50-D89 | 3 | 24 | 278,616 | 1,950,313 | 10.33 |
| 4 | Endocrine, nutritional and metabolic diseases | E00-E90 | 3 | 32 | 124,938 | 874,563 | 12.22 |
| 5 | Mental and behavioral disorders | F00-F99 | 3 | 26 | 278,597 | 1,950,179 | 10.33 |
| 6 | Diseases of the nervous system | G00-G99 | 3 | 33 | 282,459 | 1,977,210 | 10.34 |
| 7 | Diseases of the eye and adnexa | H00-H59 | 4 | 30 | 222,020 | 1,554,140 | 6.26 |
| 8 | Diseases of the ear and mastoid process | H60-H95 | 3 | 11 | 251,763 | 1,762,343 | 10.09 |
| 9 | Diseases of the circulatory system | I00-I99 | 3 | 22 | 229,876 | 1,609,133 | 9.90 |
| 10 | Diseases of the respiratory system | J00-J99 | 4 | 37 | 425,243 | 2,976,701 | 7.51 |
| 11 | Diseases of the digestive system | K00-K93 | 4 | 34 | 406,862 | 2,848,035 | 7.40 |
| 12 | Diseases of the skin and subcutaneous tissue | L00-L99 | 4 | 34 | 268,300 | 1,878,097 | 6.77 |
| 13 | Diseases of the musculoskeletal system and connective tissue | M00-M99 | 4 | 12 | 17,983 | 125,878 | 10.21 |
| 14 | Diseases of the genitourinary system | N00-N99 | 4 | 33 | 430,379 | 3,012,652 | 7.54 |
| 14a | Diseases of the genitourinary system: urinary system | N00-N39 | 3 | 25 | 112,696 | 788,872 | 12.30 |
| 14b | Diseases of the genitourinary system: pelvis, genitals and breasts | N40-N99 | 4 | 29 | 430,367 | 3,012,569 | 7.54 |
| 15 | Pregnancy, childbirth and the puerperium | O00-O99 | 6 | 15 | 132,651 | 928,556 | 4.73 |
| 16 | Certain conditions originating in the perinatal period | P00-P96 | 6 | 15 | 178,380 | 1,248,662 | 5.55 |
| 17 | Congenital malformations, deformations and chromosomal abnormalities | Q00-Q99 | 4 | 41 | 425,236 | 2,976,652 | 7.51 |
| 18 | Symptoms, signs and abnormal clinical and laboratory findings, nec | R00-R99 | 4 | 33 | 425,231 | 2,976,619 | 7.51 |
| Total Releases | | | 4 | 48 | 434,237 | 3,039,661 | 7.56 |

4.17. TGPC Compressor Station 249 (Carlisle NY)

4.17a. Facility Profile

Table 4.17a.

TPGC Compressor Station 249

Carlisle NY

| | |
|--|--|
| Facility name, short | TPGC Compressor Station 249 |
| Facility name, full | TPGC CS 249 |
| EIS Facility ID | 8435311 |
| DEC Region | 4 |
| County | Schoharie |
| Town | Carlisle |
| Village \ Hamlet | |
| Address | 2480 US Route 20 |
| Zip | 12031 |
| DEC Permit Type | Air Title V Facility |
| DEC Facility ID | 4432400005 |
| DEC Permit ID | 4-4324-00005/00007 |
| DEC Permit Effective Date | 11/6/2015 |
| DEC Permit Description | Renewal of the Title V permit. |
| DEC Permit Review Report | |
| Company | Tennessee Gas Pipeline Company |
| Project | Part of the Niagara Expansion Project by TGP/Kinder Morgan, which is related to National Fuel's Northern Access Project. |
| Pipeline | Tennessee Gas Pipeline |
| Principal Supply Source | |
| System Configuration (Primary/Secondary) | |
| Status | Operational |
| Horsepower, existing | 9,100 HP |
| | |
| Total estimated releases (2008-2014): pounds | |
| Total estimated releases (2008-2014): rank | |

4.17b. Health Effects of Facility Releases

Table 4.17b.

TGPC Compressor Station 249: Facility Releases by Health Effects

Carlisle NY

| International Classification of Disease, 10 th edition | | | State Rank | Ch # | 2008-14 Estimated Lbs. | | % of State |
|---|---|---------|------------|-----------|------------------------|------------------|--------------|
| Chapter | Description | Code | | | Average | Total | |
| 2 | Neoplasms | C00-D48 | 2 | 41 | 194,333 | 1,360,334 | 14.19 |
| 2a | Malignant neoplasms | C00-C97 | 2 | 38 | 190,789 | 1,335,524 | 14.21 |
| 2a.1 | Lip, oral cavity and pharynx | C00-C14 | 3 | 8 | 22,754 | 159,281 | 11.06 |
| 2a.2 | Digestive organs | C15-C26 | 3 | 30 | 22,925 | 160,478 | 10.97 |
| 2a.3 | Respiratory system and intrathoracic organs | C30-C39 | 2 | 26 | 190,447 | 1,333,127 | 14.23 |
| 2a.4 | Bone and articular cartilage | C40-C41 | 2 | 23 | 176,886 | 1,238,204 | 14.12 |
| 2a.5 | Skin | C43-C44 | 8 | 7 | 71 | 495 | 1.86 |
| 2a.6 | Connective and soft tissue | C45-C49 | 10 | 8 | 70 | 493 | 1.80 |
| 2a.07 | Breast and female genital organs | C50-C58 | 2 | 19 | 92,653 | 648,571 | 14.96 |
| 2a.07.50 | Female breast | C50 | 2 | 17 | 79,589 | 557,125 | 14.69 |
| 2a.07.55 | Uterus | C55 | 7 | 3 | 26 | 183 | 3.73 |
| 2a.07.56 | Ovary | C56 | 8 | 2 | 66 | 461 | 1.77 |
| 2a.08 | Male genital organs | C60-C63 | 4 | 10 | 21,935 | 153,543 | 10.97 |
| 2a.09 | Urinary organs | C64-C68 | 3 | 18 | 22,813 | 159,689 | 11.08 |
| 2a.10 | Eye, brain and central nervous system | C69-C72 | 3 | 18 | 22,912 | 160,382 | 10.97 |
| 2a.11 | Endocrine glands and related structures | C73-C75 | 4 | 7 | 21,956 | 153,691 | 10.89 |
| 2a.12 | Secondary and ill-defined | C76-C80 | 10 | 3 | 58 | 409 | 1.23 |
| 2a.13 | Stated or presumed to be primary, of lymphoid, haematopoietic, related | C81-C96 | 2 | 23 | 92,946 | 650,622 | 14.83 |
| 2a.14 | Independent (primary) multiple sites | C97 | -- | 0 | 0 | 0 | 0.00 |
| 2b | In situ neoplasms | D00-D09 | 9 | 3 | 80 | 560 | 1.34 |
| 2c | Benign neoplasms | D10-D36 | 6 | 21 | 1,454 | 10,181 | 6.15 |
| 2d | Neoplasms of uncertain or unknown behavior | D37-D48 | 3 | 28 | 22,890 | 160,231 | 11.02 |
| 3 | Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism | D50-D89 | 2 | 25 | 299,200 | 2,094,397 | 11.09 |
| 4 | Endocrine, nutritional and metabolic diseases | E00-E90 | 2 | 34 | 136,996 | 958,972 | 13.39 |
| 5 | Mental and behavioral disorders | F00-F99 | 2 | 27 | 299,178 | 2,094,247 | 11.10 |
| 6 | Diseases of the nervous system | G00-G99 | 2 | 34 | 303,242 | 2,122,695 | 11.10 |
| 7 | Diseases of the eye and adnexa | H00-H59 | 3 | 31 | 368,833 | 2,581,834 | 10.40 |
| 8 | Diseases of the ear and mastoid process | H60-H95 | 2 | 12 | 276,272 | 1,933,902 | 11.07 |
| 9 | Diseases of the circulatory system | I00-I99 | 2 | 23 | 258,460 | 1,809,220 | 11.13 |
| 10 | Diseases of the respiratory system | J00-J99 | 3 | 38 | 604,524 | 4,231,665 | 10.67 |
| 11 | Diseases of the digestive system | K00-K93 | 3 | 35 | 576,081 | 4,032,565 | 10.48 |
| 12 | Diseases of the skin and subcutaneous tissue | L00-L99 | 3 | 35 | 438,754 | 3,071,281 | 11.07 |
| 13 | Diseases of the musculoskeletal system and connective tissue | M00-M99 | 2 | 13 | 28,130 | 196,907 | 15.97 |
| 14 | Diseases of the genitourinary system | N00-N99 | 3 | 34 | 613,568 | 4,294,974 | 10.75 |
| 14a | Diseases of the genitourinary system: urinary system | N00-N39 | 2 | 26 | 120,350 | 842,447 | 13.14 |
| 14b | Diseases of the genitourinary system: pelvis, genitals and breasts | N40-N99 | 3 | 30 | 613,556 | 4,294,893 | 10.75 |
| 15 | Pregnancy, childbirth and the puerperium | O00-O99 | 3 | 16 | 267,623 | 1,873,364 | 9.54 |
| 16 | Certain conditions originating in the perinatal period | P00-P96 | 3 | 16 | 337,101 | 2,359,705 | 10.48 |
| 17 | Congenital malformations, deformations and chromosomal abnormalities | Q00-Q99 | 3 | 43 | 604,523 | 4,231,660 | 10.67 |
| 18 | Symptoms, signs and abnormal clinical and laboratory findings, nec | R00-R99 | 3 | 34 | 604,520 | 4,231,638 | 10.67 |
| Total Releases | | | 3 | 50 | 617,612 | 4,323,285 | 10.76 |

4.18. TGPC Compressor Station 254 (Chatham NY)

4.18a. Facility Profile

Table 4.18a.

TPGC Compressor Station 254

Chatham NY

| | |
|--|--|
| Facility name, short | TPGC Compressor Station 254 |
| Facility name, full | TPGC CS 254 |
| EIS Facility ID | 8525311 |
| DEC Region | 4 |
| County | Columbia |
| Town | Chatham |
| Village \ Hamlet | Riders-Mills |
| Address | ST Rte 66 -- E Side S of County Line |
| Zip | 12123 |
| DEC Facility ID | 4102600037 |
| DEC Permit Type | Air Title V Facility |
| DEC Permit ID | 4-1026-00037/00029 |
| DEC Permit Effective Date | 8/11/2014 |
| DEC Permit Description | |
| DEC Permit Review Report | |
| Company | Tennessee Gas Pipeline Company |
| Project | Part of the Niagara Expansion Project by TGP/Kinder Morgan, which is related to National Fuel's Northern Access Project. |
| Pipeline | Tennessee Gas Pipeline |
| Principal Supply Source | |
| System Configuration (Primary/Secondary) | |
| Status | Operational |
| Horsepower, existing | 10,475 |
| | (1) gas turbine, (6) reciprocating engines |

4.18b. Health Effects of Facility Releases

Table 4.18b.

TGPC Compressor Station 254: Facility Releases by Health Effects

Chatham NY

| International Classification of Disease, 10 th edition | | | State Rank | Ch # | 2008-14 Estimated Lbs. | | % of State |
|---|---|---------|------------|-----------|------------------------|------------------|-------------|
| Chapter | Description | Code | | | Average | Total | |
| 2 | Neoplasms | C00-D48 | 9 | 23 | 57,856 | 404,994 | 4.23 |
| 2a | Malignant neoplasms | C00-C97 | 9 | 22 | 56,750 | 397,251 | 4.23 |
| 2a.1 | Lip, oral cavity and pharynx | C00-C14 | 13 | 7 | 4,723 | 33,063 | 2.30 |
| 2a.2 | Digestive organs | C15-C26 | 13 | 14 | 4,732 | 33,124 | 2.26 |
| 2a.3 | Respiratory system and intrathoracic organs | C30-C39 | 9 | 20 | 56,703 | 396,923 | 4.24 |
| 2a.4 | Bone and articular cartilage | C40-C41 | 10 | 18 | 52,602 | 368,212 | 4.20 |
| 2a.5 | Skin | C43-C44 | 10 | 3 | 33 | 234 | 0.88 |
| 2a.6 | Connective and soft tissue | C45-C49 | 4 | 8 | 298 | 2,088 | 7.64 |
| 2a.07 | Breast and female genital organs | C50-C58 | 9 | 11 | 25,754 | 180,276 | 4.16 |
| 2a.07.50 | Female breast | C50 | 9 | 10 | 21,664 | 151,648 | 4.00 |
| 2a.07.55 | Uterus | C55 | 15 | 2 | | | 0.00 |
| 2a.07.56 | Ovary | C56 | 10 | 3 | 34 | 237 | 0.91 |
| 2a.08 | Male genital organs | C60-C63 | 13 | 5 | 4,382 | 30,671 | 2.19 |
| 2a.09 | Urinary organs | C64-C68 | 13 | 12 | 4,607 | 32,249 | 2.24 |
| 2a.10 | Eye, brain and central nervous system | C69-C72 | 13 | 11 | 4,770 | 33,391 | 2.28 |
| 2a.11 | Endocrine glands and related structures | C73-C75 | 14 | 6 | 4,234 | 29,641 | 2.10 |
| 2a.12 | Secondary and ill-defined | C76-C80 | 4 | 5 | 642 | 4,497 | 13.50 |
| 2a.13 | Stated or presumed to be primary, of lymphoid, haematopoietic, related | C81-C96 | 9 | 16 | 26,113 | 182,788 | 4.17 |
| 2a.14 | Independent (primary) multiple sites | C97 | -- | 0 | 0 | 0 | 0.00 |
| 2b | In situ neoplasms | D00-D09 | 5 | 2 | 392 | 2,743 | 6.56 |
| 2c | Benign neoplasms | D10-D36 | 10 | 11 | 265 | 1,854 | 1.12 |
| 2d | Neoplasms of uncertain or unknown behavior | D37-D48 | 13 | 14 | 4,660 | 32,623 | 2.24 |
| 3 | Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism | D50-D89 | 6 | 17 | 161,398 | 1,129,784 | 5.98 |
| 4 | Endocrine, nutritional and metabolic diseases | E00-E90 | 9 | 20 | 40,522 | 283,651 | 3.96 |
| 5 | Mental and behavioral disorders | F00-F99 | 6 | 16 | 161,398 | 1,129,784 | 5.99 |
| 6 | Diseases of the nervous system | G00-G99 | 6 | 19 | 162,516 | 1,137,610 | 5.95 |
| 7 | Diseases of the eye and adnexa | H00-H59 | 5 | 19 | 194,478 | 1,361,349 | 5.48 |
| 8 | Diseases of the ear and mastoid process | H60-H95 | 6 | 10 | 157,064 | 1,099,446 | 6.30 |
| 9 | Diseases of the circulatory system | I00-I99 | 6 | 15 | 147,900 | 1,035,300 | 6.37 |
| 10 | Diseases of the respiratory system | J00-J99 | 5 | 24 | 337,862 | 2,365,031 | 5.97 |
| 11 | Diseases of the digestive system | K00-K93 | 5 | 21 | 329,499 | 2,306,496 | 6.00 |
| 12 | Diseases of the skin and subcutaneous tissue | L00-L99 | 5 | 22 | 215,885 | 1,511,192 | 5.45 |
| 13 | Diseases of the musculoskeletal system and connective tissue | M00-M99 | 9 | 9 | 8,668 | 60,676 | 4.92 |
| 14 | Diseases of the genitourinary system | N00-N99 | 5 | 21 | 340,832 | 2,385,827 | 5.97 |
| 14a | Diseases of the genitourinary system: urinary system | N00-N39 | 11 | 14 | 35,305 | 247,133 | 3.85 |
| 14b | Diseases of the genitourinary system: pelvis, genitals and breasts | N40-N99 | 5 | 20 | 340,830 | 2,385,810 | 5.97 |
| 15 | Pregnancy, childbirth and the puerperium | O00-O99 | 4 | 10 | 162,679 | 1,138,751 | 5.80 |
| 16 | Certain conditions originating in the perinatal period | P00-P96 | 4 | 14 | 184,151 | 1,289,056 | 5.73 |
| 17 | Congenital malformations, deformations and chromosomal abnormalities | Q00-Q99 | 5 | 24 | 337,861 | 2,365,027 | 5.97 |
| 18 | Symptoms, signs and abnormal clinical and laboratory findings, nec | R00-R99 | 5 | 22 | 337,861 | 2,365,025 | 5.97 |
| Total Releases | | | 5 | 27 | 341,952 | 2,393,661 | 5.96 |

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DRAFT

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To answer this question, we begin with three facts: (1) chemicals cause disease and early death, (2) all risk is relative, and (3) determining risk is inherently difficult.

To begin to access the risk posed by the chemical pollution routinely released by compressor stations certain basic information is needed:

- The number of chemicals released.
- The volume of chemicals released.
- Average versus peak exposures.
- The health effects associated with each individual chemical.
- The health effects associated with a mixture of many chemicals, i.e., are effects additive, less than additive or synergistic.
- The characteristics of exposed populations: age, sex, existing health status, other sources of chemical exposure.
- An understanding of geographic and climactic variables.

It is only after this data is gathered can one begin a risk assessment.

Absent this data, a risk assessment is impossible.

Assuming this data exists, two questions must be asked:

- Who gets to do the risk assessment?
- Who gets to decide what level of risk is “acceptable”?