New York State

DEC

Division of Mineral Resources

Appendices

DRAFT
Supplemental Generic Environmental Impact Statement on the Oil, Gas and Solution Mining Regulatory Program

Well Permit Issuance for Horizontal Drilling And High-Volume Hydraulic Fracturing to Develop the Marcellus Shale and Other Low-Permeability Gas Reservoirs

New York State Department of Environmental Conservation

Table of Appendices

APPENDIX NO.	TITLE
1	FEMA Flood Insurance Rate Map Availability
2	1992 SEQRA Findings Statement On the GEIS on the Oil, Gas, and Solution Mining Regulatory Program
3	Supplemental SEQRA Findings Statement On Leasing of State Lands for Activities Regulated Under the Oil, Gas, and Solution Mining Law
4	Application Form for Permit to Drill, Deepen, Plug Back or Convert a Well Subject to the Oil, Gas, and Solution Mining Regulatory Program
5	Environmental Assessment Form For Well Permitting
6	PROPOSED Environmental Assessment Form (EAF) Addendum
7	Sample Drilling Rig Specifications Provided By Chesapeake Energy
8	Casing & Cementing Practices Required for All Wells in NY
9	Fresh Water Aquifer Supplementary Permit Conditions Required for All Wells in Primary and Principal Aquifers
10	PROPOSED Supplementary Permit Conditions for High-Volume Hydraulic Fracturing
11	Analysis of Surface Mobility of Fracturing Fluids Excerpted from ICF International, Task 1, 2009
12	Beneficial Use Determination (BUD) Notification Regarding Roadspreading
13	NYS Marcellus Radiological Data From Production Brine
14	Department of Public Service Environmental Management & Construction Standards and Practices - Pipelines
15	Hydraulic Fracturing – 15 Statements from Regulatory Officials
16	Applicability of NOx RACT Requirements for Natural Gas Production Facilities
17	Applicability of Proposed Revision of 40 CFG Part 63 Subpart ZZZZ (Engine MACT) for Natural Gas Production Facilities
18	Clean Air Act Unique Regulatory Definition of Facility for the Oil and Gas Industry
19	Greenhouse Gas (GHG) Emissions
20	PROPOSED Pre-Frac Checklist and Certification
21	Publically Owned Treatment Works (POTWs) With Approved Pretreatment Programs
22	NYSDEC - Division of Water Hydrofracturing Chemical (HFC) Evaluation Requirements for POTWs
23	USEPA Natural Gas STAR Program
24	Key Features of USEPA Natural Gas STAR Program
25	Reduced Emissions Completion (REC) Executive Summary
26	Instructions for Using The On-Line Searchable Database To Locate Drilling Applications

New York State

DEC

Division of Mineral Resources

Appendix 1

FEMA
Flood Insurance Rate Map
Availability

Excerpted from Alpha Environmental, 2009

Draft Supplemental Generic Environmental Impact Statement

TABLE 3.4

Summary of FEMA Flood Insurance Rate Map (FIRM) Availability

County	Community Name	Current FIRM Effective Date
Albany	Albany, City of	4/15/1980
Albany	Altamont, Village of	8/15/1983
Albany	Berne,Town of	8/1/1987 (L)
Albany	Bethlehem, Town of	4/17/1984
Albany	Coeymans, Town of	8/3/1989
Albany	Cohoes, City of	12/4/1979
Albany	Colonie, Town of	9/5/1979
Albany	Green Island, Village of	6/4/1980
Albany	Guilderland, Town of	1/6/1983
Albany	Knox, Township of	8/13/1982 (M)
Albany	Menands, Village of	3/18/1980
Albany	New Scotland, Town of	12/1/1982
Albany	Ravena, Village of	4/2/1982 (M)
Albany	Rensselaerville, Town of	8/27/1982 (M)
Albany	Voorheesville, Village of	12/1/1982
Albany	Watervliet, City of	1/2/1980
Albany	Westerlo, Town of	8/3/1989
Allegany	Alfred, Town of	10/7/1983 (M)
Allegany	Alfred, Village of	2/15/1980
Allegany	Allen, Town of	7/16/1982 (M)
Allegany	Alma, Town of	10/7/1983 (M)
Allegany	Almond, Village of	2/15/1980
Allegany	Amity, Town of	12/18/1984
Allegany	Andover, Town of	3/2/1998
Allegany	Andover, Village of	4/2/1979
Allegany	Angelica, Town of	12/31/1982 (M)
Allegany	Angelica, Village of	2/1/1984
Allegany	Belfast, Town of	8/6/1982 (M)
Allegany	Belmont, Village of	12/18/1984
Allegany	Birdsall, Town of	7/16/1982 (M)
Allegany	Bolivar, Town of	7/30/1982 (M)
Allegany	Bolivar, Village of	1/19/1996
Allegany	Burns, Town of	7/16/1982 (M)
Allegany	Canaseraga, Village of	12/2/1983 (M)
Allegany	Caneadea, Town of	8/20/1982 (M)
Allegany	Clarksville, Town of	11/12/1982 (M)
Allegany	Cuba, Town of	7/30/1982 (M)
Allegany	Cuba, Village of	4/17/1978
Allegany	Friendship, Town of	12/18/1984
Allegany	Genesee, Town of	7/30/1982 (M)
Allegany	Granger, Town of	10/7/1983 (M)
Allegany	Grove, Town of	11/6/1991
Allegany	Hume, Town of	10/2/1997
Allegany	Independence, Town of	7/9/1982 (M)
Allegany	New Hudson, Town of	8/20/1982 (M)
Allegany	Richburg, Village of	1/5/1978
Allegany	Rushford, Town of	12/23/1983 (M)
Allegany	Scio, Town of	3/18/1985
Allegany	Ward,Town of	(NSFHA)
Allegany	Wellsville, Town of	3/18/1985
Allegany	Wellsville, Village of	7/17/1978

TABLE 3.4

Summary of FEMA Flood Insurance Rate Map (FIRM) Availability

County	Community Name	Current FIRM Effective Date
Allegany	West Almond, Town of	(NSFHA)
Allegany	Willing, Town of	12/24/1982 (M)
Allegany	Wirt, Town of	6/25/1982 (M)
Broome	Barker, Town of	2/5/1992
Broome	Binghamton, City of	6/1/1977
Broome	Binghamton, Town of	1/6/1984 (M)
Broome	Chenango, Town of	8/17/1981
Broome	Colesville, Town of	1/20/1993
Broome	Conklin, Town of	7/17/1981
Broome	Dickinson, Town of	4/15/1977
Broome	Endicott, Village of	9/7/1998
Broome	Fenton, Town of	8/3/1981
Broome	Johnson City, Village of	9/30/1977
Broome	Kirkwood, Town of	6/1/1977
Broome	Lisle, Town of	8/20/2002
Broome	Lisle, Village of	1/6/1984 (M)
Broome	Maine, Town of	2/5/1992
Broome	Nanticoke, Town of	12/18/1985
Broome	Port Dickinson, Village of	5/2/1977
Broome	Sanford, Town of	6/4/1980
Broome	Triangle, Town of	7/20/1984 (M)
Broome	Union, Town of	9/30/1988
Broome	Vestal, Town of	3/2/1998
Broome	Whitney Point, Village of	1/6/1984 (M)
Broome	Windsor, Town of	9/30/1992
Broome	Windsor, Village of	5/18/1992
Cattaraugus	Allegany, Town of	11/15/1978
Cattaraugus	Allegany, Village of	12/17/1991
Cattaragus	Ashford, Township of	5/25/1984
Cattaraugus	Carrollton, Town of	3/18/1983 (M)
Cattaraugus	Cattaraugus, Village of	4/20/1984 (M)
Cattaraugus	Cold Spring, Town of	3/1/1978
Cattaraugus	Conewango, Town of	7/30/1982 (M)
Cattaraugus	Dayton, Town of	5/25/1984 (M)
Cattaraugus	Delevan, Village of	1/20/1984 (M)
Cattaraugus	East Otto, Town of	4/20/1984 (M)
Cattaraugus	East Randolph, Village of	2/1/1978
Cattaraugus	Ellicottville, Town of	1/19/2000
Cattaraugus	Ellicottville, Village of	5/2/1994
Cattaraugus	Farmersville, Town of	7/23/1982 (M)
Cattaraugus	Franklinville, Town of	7/17/1978
Cattaraugus	Franklinville, Village of	7/3/1978
Cattaraugus	Freedom, Town of	8/19/1991
Cattaraugus	Great Valley, Town of	7/17/1978
Cattaraugus	Hinsdale, Town of	1/17/1979
Cattaraugus	Humphrey, Town of	8/13/1982 (M)
Cattaraugus	Ischua, Town of	8/15/1978
Cattaraugus	Leon, Town of	8/13/1982 (M)
Cattaraugus	Limestone, Village of	4/17/1978
Cattaraugus	Little Valley, Town of	6/22/1984 (M)
Cattaraugus	Little Valley, Village of	2/1/1978

TABLE 3.4

Summary of FEMA Flood Insurance Rate Map (FIRM) Availability

County	Community Name	Current FIRM Effective Date
Cattaraugus	Lyndon, Town of	7/16/1982 (M)
Cattaraugus	Machias, Town of	8/20/1982 (M)
Cattaraugus	Mansfield, Town of	5/25/1984 (M)
Cattaraugus	Napoli, Town of	7/2/1982 (M)
Cattaraugus	New Albion, Town of	12/3/1982 (M)
Cattaraugus	Olean, City of	5/9/1980
Cattaraugus	Olean, Town of	2/1/1979
Cattaraugus	Otto, Town of	4/20/1984 (M)
Cattaraugus	Perrysburg, Town of	4/20/1984 (M)
Cattaraugus	Persia, Town of	4/20/1984 (M)
Cattaraugus	Portville, Town of	7/18/1983
Cattaraugus	Portville, Village of	4/17/1978
Cattaraugus	Randolph, Town of	11/5/1982 (M)
Cattaraugus	Randolph, Village of	8/1/1978
Cattaraugus	Salamanca, City of	4/17/1978
Cattaraugus	Salamanca, Town of	11/1/1979
Cattaraugus	South Dayton, Village of	1/5/1978
Cattaraugus	South Valley, Town of	12/2/1983 (M)
Cattaraugus	Yorkshire, Town of	5/25/1984 (M)
Cattaraugus/Erie/ Chautauqua/Allegany	Seneca Nation of Indians	9/30/1988
Cayuga	Auburn, City of	8/2/2007
Cayuga	Aurelius, Town of	8/2/2007
Cayuga	Aurora, Village of	8/2/2007
Cayuga	Brutus, Town of	8/2/2007
Cayuga	Cato, Town of	8/2/2007
Cayuga	Cato, Village of	8/2/2007
Cayuga	Cayuga, Village of	8/2/2007
Cayuga	Conquest, Town of	8/2/2007
Cayuga	Fair Haven, Village of	8/2/2007
Cayuga	Fleming, Town of	8/2/2007
Cayuga	Genoa,Town of	8/2/2007
Cayuga	Ira, Town of	8/2/2007
Cayuga	Ledyard, Town of	8/2/2007
Cayuga	Locke, Town of	8/2/2007
Cayuga	Mentz, Town of	8/2/2007
Cayuga	Meridian, Village of	8/2/2007
Cayuga	Montezuma, Town of	8/2/2007
Cayuga	Moravia, Town of	8/2/2007
Cayuga	Moravia, Village of	8/2/2007
Cayuga	Niles, Town of	8/2/2007
Cayuga	Owasco, Town of	8/2/2007
Cayuga	Port Byron, Village of	8/2/2007
Cayuga	Scipio, Town of	8/2/2007
Cayuga	Sempronius, Town of	8/2/2007
Cayuga	Sennett, Town of	8/2/2007
Cayuga	Springport, Town of	8/2/2007
Cayuga	Sterling, Town of	8/2/2007
Cayuga	Summer Hill, Town of	8/2/2007
Cayuga	Throop, Town of	8/2/2007
Cayuga	Union Springs, Village of	8/2/2007

TABLE 3.4

Summary of FEMA Flood Insurance Rate Map (FIRM) Availability

County	Community Name	Current FIRM Effective Date
Cayuga	Venice, Town of	8/2/2007
Cayuga	Victory, Town of	8/2/2007
Cayuga	Weedsport, Village of	8/2/2007
Chautauqua	Arkwright, Town of	4/8/1983 (M)
Chautauqua	Bemus Point, Village of	11/2/1977
Chautauqua	Brocton, Village of	(NSFHA)
Chautauqua	Busti, Town of	1/20/1993
Chautauqua	Carroll, Town of	10/29/1982 (M)
Chautauqua	Cassadaga, Village of	12/1/1977
Chautauqua	Celoron, Village of	3/18/1980
Chautauqua	Charlotte, Town of	3/23/1984 (M)
Chautauqua	Chautauqua, Town of	6/15/1984
Chautauqua	Cherry Creek, Town of	7/2/1982 (M)
Chautauqua	Cherry Creek, Village of	2/15/1978
Chautauqua	Clymer, Town of	10/7/1983 (M)
Chautauqua	Dunkirk, City of	2/4/1981
Chautauqua	Dunkirk, Town of	8/6/1982 (M)
Chautauqua	Ellery, Town of	3/18/1980
Chautauqua	Ellicott, Town of	8/1/1984
Chautauqua	Ellington, Town of	10/7/1983 (M)
Chautauqua	Falconer, Village of	1/5/1978
Chautauqua	Forestville, Village of	3/18/1983 (M)
Chautauqua	Fredonia, Village of	11/15/1989
Chautauqua	French Creek, Town of	6/8/1984 (M)
Chautauqua	Gerry, Town of	1/6/1984 (M)
Chautauqua	Hanover, Town of	12/18/1984
Chautauqua	Harmony, Township of	12/1/1986 (L)
Chautauqua	Jamestown, City of	6/1/1978
Chautauqua	Kiantone, Town of	2/2/1996
Chautauqua	Lakewood, Village of	11/2/1977
Chautauqua	Mayville, Village of	1/5/1978
Chautauqua	Mina, Town of	1/2/2003
Chautauqua	North Harmony, Town of	2/15/1980
Chautauqua	Panama, Village of	3/1/1978
Chautauqua	Poland, Town of	3/11/1983 (M)
Chautauqua	Pomfret, Town of	12/18/1984
Chautauqua	Portland, Town of	10/7/1983 (M)
Chautauqua	Ripley,Town of	(NSFHA)
Chautauqua	Sheridan, Town of	10/7/1983 (M)
Chautauqua	Sherman, Village of	3/1/1978
Chautauqua	Sherman,Town of	1/6/1984 (M)
Chautauqua	Silver Creek, Village of	8/1/1983
Chautauqua	Sinclairville, Village of	12/1/1977
Chautauqua	Stockton, Town of	10/21/1983 (M)
Chautauqua	Villenova, Town of	5/21/1982 (M)
Chautauqua	Westfield, Town of	6/8/1984 (M)
Chautauqua	Westfield, Village of	10/7/1983 (M)
Chemung	Ashland, Town of	1/16/1980
Chemung	Baldwin, Town of	7/23/1982 (M)
Chemung	Big Flats, Town of	8/18/1992
Chemung	Catlin, Town of	6/22/1984 (M)

TABLE 3.4

Summary of FEMA Flood Insurance Rate Map (FIRM) Availability

County	Community Name	Current FIRM Effective Date
Chemung	Chemung, Town of	9/3/1980
Chemung	Elmira Heights, Village of	9/29/1996
Chemung	Elmira, City of	4/2/1997
Chemung	Elmira, Town of	9/29/1996
Chemung	Erin, Town of	8/13/1982 (M)
Chemung	Horseheads, Town of	9/29/1996
Chemung	Horseheads, Village of	9/29/1996
Chemung	Millport, Village of	6/15/1988 (M)
Chemung	Southport, Town of	8/5/1991
Chemung	Van Etten, Town of	9/28/1979 (M)
Chemung	Van Etten, Village of	7/1/1988 (L)
Chemung	Veteran, Town of	2/18/1983 (M)
Chemung	Wellsburg, Village of	6/15/1981
Chenango	Afton, Town of	9/30/1992
Chenango	Afton, Village of	9/30/1992
Chenango	Bainbridge, Town of	12/3/1991
Chenango	Bainbridge, Village of	6/2/1993
Chenango	Columbus, Town of	4/8/1983 (M)
Chenango	Coventry, Town of	10/15/1985 (M)
Chenango	Earlville, Village of	6/5/1985 (S)
Chenango	German, Town of	9/24/1984 (M)
Chenango	Greene, Town of	8/3/1981
Chenango	Greene, Village of	8/3/1981
Chenango	Guilford, Town of	7/6/1984 (M)
Chenango	Lincklaen, Town of	3/23/1984 (M)
Chenango	Mc Donough, Town of	6/5/1985 (M)
Chenango	New Berlin, Town of	6/5/1985 (M)
Chenango	New Berlin, Village of	11/4/1983 (M)
Chenango	North Norwich, Town of	12/3/1991
Chenango	Norwich, City of	12/18/1985
Chenango	Norwich, Town of	11/15/1984
Chenango	Otselic, Town of	6/5/1985 (M)
Chenango	Oxford, Town of	8/24/1984 (M)
Chenango	Oxford, Village of	9/10/1984 (M)
Chenango	Pharsalia, Town of	8/24/1984 (S)
Chenango	Pitcher, Town of	3/4/1986 (M)
Chenango	Plymouth, Town of	11/4/1983 (M)
Chenango	Preston, Town of	4/1/1983 (M)
Chenango	Sherburne, Town of	8/24/1984 (M)
Chenango	Sherburne, Village of	9/10/1984 (M)
Chenango	Smithville, Town of	11/4/1983 (M)
Chenango	Smyrna, Town of	9/24/1984 (M)
Chenango	Smyrna, Village of	10/15/1985 (M)
Clinton	Altona, Town of	9/28/2007 (M)
Clinton	Ausable, Town of	9/28/2007 (M)
Clinton	Beekmantown, Town of	9/28/2007
Clinton	Black Brook, Town of	9/28/2007
Clinton	Champlain, Town of	9/28/2007
Clinton	Champlain, Village of	9/28/2007
Clinton	Chazy, Town of	9/28/2007
Clinton	Clinton, Town of	9/28/2007 (M)

TABLE 3.4

Summary of FEMA Flood Insurance Rate Map (FIRM) Availability

County	Community Name	Current FIRM Effective Date
Clinton	Ellenburg, Town of	9/28/2007 (M)
Clinton	Mooers, Town of	9/28/2007 (M)
Clinton	Peru,Town of	9/28/2007
Clinton	Plattsburgh, City of	9/28/2007
Clinton	Plattsburgh, Town of	9/28/2007
Clinton	Rouses Point, Village of	9/28/2007
Clinton	Saranac, Town of	9/28/2007
Clinton	Schuyler Falls, Town of	9/28/2007
Columbia	Ancram, Town of	6/5/1985 (M)
Columbia	Austerlitz, Town of	6/5/1985 (M)
Columbia	Canaan, Town of	7/3/1985 (M)
Columbia	Chatham, Town of	9/15/1993
Columbia	Chatham, Village of	12/15/1982
Columbia	Claverack, Town of	9/6/1989
Columbia	Clermont, Township of	9/5/1984
Columbia	Copake, Town of	6/19/1985 (M)
Columbia	Gallatin, Town of	10/16/1984
Columbia	Germantown, Town of	5/11/1979 (M)
Columbia	Ghent, Town of	1/1/1988 (L)
Columbia	Greenport, Town of	11/15/1989
Columbia	Hillsdale, Town of	5/15/1985 (M)
Columbia	Hudson, City of	9/29/1989
Columbia	Kinderhook, Town of	12/1/1982
Columbia	Kinderhook, Village of	12/1/1982
Columbia	Livingston, Town of	5/11/1979 (M)
Columbia	New Lebanon, Town of	6/5/1985 (M)
Columbia	Stockport, Town of	1/19/1983
Columbia	Stuyvesant, Town of	9/14/1979 (M)
Columbia	Taghkanic, Town of	1/3/1986 (M)
Columbia	Valatie, Village of	12/1/1982
Cortland	Cincinnatus, Town of	5/15/1985 (M)
Cortland	Cortland, City of	8/15/1983
Cortland	Cortlandville, Town of	8/15/1983
Cortland	Cuyler, Town of	5/15/1985
Cortland	Freetown, Town of	1/17/1975
Cortland	Harford, Town of	5/15/1985 (M)
Cortland	Homer, Town of	8/15/1983
Cortland	Homer, Village of	8/15/1983
Cortland	Lapeer, Town of	7/20/1984 (M)
Cortland	Marathon, Town of	5/15/1985 (S)
Cortland	Marathon, Village of	10/15/1982
Cortland	Mcgraw, Village of	12/1/1982
Cortland	Preble, Town of	5/15/1985 (M)
Cortland	Scott, Town of	5/15/1985 (M)
Cortland	Solon, Town of	5/15/1985
Cortland	Taylor, Town of	5/15/1985 (M)
Cortland	Truxton, Town of	5/15/1985 (M)
Cortland	Virgil, Town of	5/15/1985 (M)
Cortland	Willet, Town of	7/20/1984 (M)
Delaware	Andes, Town of	5/1/1985 (M)
Delaware	Andes, Village of	4/1/1986 (L)

TABLE 3.4

Summary of FEMA Flood Insurance Rate Map (FIRM) Availability

County	Community Name	Current FIRM Effective Date
Delaware	Bovina, Town of	5/1/1985 (M)
Delaware	Colchester,Town of	2/4/1987
Delaware	Davenport, Town of	2/2/2002
Delaware	Delhi, Town of	7/18/1985
Delaware	Delhi, Village of	7/18/1985
Delaware	Deposit, Town of	3/18/1986 (M)
Delaware	Fleischmanns, Village of	1/17/1986 (M)
Delaware	Franklin, Town of	4/1/1988 (L)
Delaware	Franklin, Village of	8/1/1987 (L)
Delaware	Hamden,Town of	3/4/1986 (M)
Delaware	Hancock, Town of	9/28/1990
Delaware	Hancock, Village of	9/28/1990
Delaware	Harpersfield, Town of	6/5/1985 (M)
Delaware	Hobart, Village of	5/15/1985 (M)
Delaware	Kortright, Town of	5/15/1985 (M)
Delaware	Margaretville, Village of	6/4/1990
Delaware	Masonville, Town of	11/1/1985 (M)
Delaware	Meredith, Town of	5/15/1985 (M)
Delaware	Middletown, Town of	8/2/1993
Delaware	Roxbury, Town of	5/15/1985 (M)
Delaware	Sidney, Town of	9/30/1987
Delaware	Sidney, Village of	9/30/1987
Delaware	Stamford, Town of	10/1/1986 (L)
Delaware	Stamford, Village of	8/1/1987 (L)
Delaware	Tompkins, Town of	11/15/1985 (M)
Delaware	Walton, Town of	9/2/1988
Delaware	Walton, Village of	4/2/1991
Delaware/Broome	Deposit, Village of	2/1/1979
Dutchess	Amenia, Town of	11/15/1989
Dutchess	Beacon, City of	3/1/1984
Dutchess	Beekman, Town of	9/5/1984
Dutchess	Clinton, Town of	7/5/1984
Dutchess	Dover, Town of	7/4/1988
Dutchess	East Fishkill, Town of	6/15/1984
Dutchess	Fishkill, Town of	6/1/1984
Dutchess	Fishkill, Village of	3/15/1984
Dutchess	Hyde Park, Town of	6/15/1984
Dutchess	Lagrange, Town of	9/8/1999
Dutchess	Milan, Town of	8/10/1979 (M)
Dutchess	Millbrook, Village of	2/27/1984 (M)
Dutchess	Millerton, Village of	1/3/1985
Dutchess	North East, Town of	9/5/1984
Dutchess	Pawling, Town of	1/3/1985
Dutchess	Pawling, Village of	8/1/1984
Dutchess	Pine Plains, Town of	10/5/1984 (M)
Dutchess	Pleasant Valley, Town of	1/16/1980
Dutchess	Poughkeepsie, City of	1/5/1984
Dutchess	Poughkeepsie, Town of	9/8/1999
Dutchess	Red Hook, Town of	10/16/1984
Dutchess	Red Hook, Village of	(NSFHA)
Dutchess	Rhinebeck, Town of	9/5/1984

TABLE 3.4

Summary of FEMA Flood Insurance Rate Map (FIRM) Availability

County	Community Name	Current FIRM Effective Date
Dutchess	Rhinebeck, Village of	2/1/1985
Dutchess	Stanford, Town of	12/17/1991
Dutchess	Tivoli, Village of	8/1/1984
Dutchess	Union Vale, Town of	9/2/1988
Dutchess	Wappinger, Town of	9/22/1999
Dutchess	Wappingers Falls, Village of	9/22/1999
Dutchess	Washington, Town of	8/17/1979 (M)
Erie	Akron, Village of	11/19/1980
Erie	Alden, Town of	2/6/1991
Erie	Alden, Village of	1/6/1984 (M)
Erie	Amherst, Town of	10/16/1992
Erie	Angola, Village of	8/6/2002
Erie	Aurora, Town of	4/16/1979
Erie	Blasdell, Village of	6/25/1976 (M)
Erie	Boston, Town of	9/30/1981
Erie	Brant, Town of	1/6/1984 (M)
Erie	Buffalo, City of	9/26/2008
Erie	Cheektowaga, Town of	3/15/1984
Erie	Clarence, Town of	3/5/1996
Erie	Colden, Town of	7/2/1979
Erie	Collins,Town of	9/26/2008
Erie	Concord, Town of	9/4/1986
Erie	Depew, Village of	8/3/1981
Erie	East Aurora, Village of	8/6/2002
Erie	Eden, Town of	8/24/1979 (M)
Erie	Elma,Town of	6/22/1998
Erie	Evans, Town of	2/2/2002
Erie	Farnham, Village of	(NSFHA)
Erie	Grand Island, Town of	9/26/2008
Erie	Hamburg, Town of	12/20/2001
Erie	Hamburg, Village of	1/20/1982
Erie	Holland, Town of	9/26/2008
Erie	Kenmore,Village of	(NSFHA)
Erie	Lackawanna, City of	7/2/1980
Erie	Lancaster, Town of	2/23/2001
Erie	Lancaster, Village of	7/2/1979
Erie	Marilla, Town of	9/29/1978
Erie	Newstead, Town of	5/4/1992
Erie	Orchard Park, Town of	3/16/1983
Erie	Orchard Park, Village of	(NSFHA)
Erie	Sardinia, Town of	1/16/2003
Erie	Sloan, Village of	(NSFHA)
Erie	Springville, Village of	7/17/1986
Erie	Tonawanda, City of	9/26/2008
Erie	Tonawanda, Town of	11/12/1982
Erie	Wales, Town of	9/26/2008
Erie	West Seneca, Town of	9/30/1992
Erie	Williamsville, Village of	9/26/2008
Erie/Cattaraugus	Gowanda, Village of	9/26/2008
Essex	Chesterfield, Town of	5/4/1987
Essex	Crown Point,Town of	7/16/1987

TABLE 3.4

Summary of FEMA Flood Insurance Rate Map (FIRM) Availability

County	Community Name	Current FIRM Effective Date
Essex	Elizabethtown, Town of	1/20/1993
Essex	Essex, Town of	4/3/1987
Essex	Jay, Town of	6/17/2002
Essex	Keene, Town of	6/5/1985 (M)
Essex	Keeseville, Village of	9/28/2007 (M)
Essex	Lake Placid, Village of	(NSFHA)
Essex	Lewis, Town of	5/15/1985 (M)
Essex	Minerva, Town of	10/5/1984 (M)
Essex	Moriah, Town of	9/24/1984 (M)
Essex	Newcomb, Town of	6/5/1985 (M)
Essex	North Elba, Town of	8/23/2001
Essex	North Hudson, Town of	5/15/1985 (M)
Essex	Port Henry, Village of	7/16/1987
Essex	Schroon, Town of	11/16/1995
Essex	St. Armand, Town of	2/5/1986
Essex	Ticonderoga, Town of	9/6/1996
Essex	Westport, Town of	9/4/1987
Essex	Willsboro, Town of	5/18/1992
Essex	Wilmington, Town of	11/16/1995
Franklin	Bangor, Town of	(NSFHA)
Franklin	Bellmont, Town of	8/5/1985 (M)
Franklin	Bombay, Town of	2/15/1985 (M)
Franklin	Brandon, Town of	(NSFHA)
Franklin	Brighton, Town of	(NSFHA)
Franklin	Brushton, Village of	2/19/1986 (M)
Franklin	Burke, Town of	2/19/1986 (M)
Franklin	Burke, Village of	(NSFHA)
Franklin	Chateaugay, Village of	(NSFHA)
Franklin	Constable, Town of	(NSFHA)
Franklin	Dickinson, Town of	3/18/1986 (M)
Franklin	Duane, Town of	(NSFHA)
Franklin	Fort Covington, Town of	12/23/1983 (M)
Franklin	Franklin, Town of	9/24/1984 (M)
Franklin	Harrietstown, Town of	1/3/1985
Franklin	Malone, Town of	9/4/1985 (M)
Franklin	Malone, Village of	4/3/1978
Franklin	Moira, Town of	4/15/1986 (M)
Franklin	Santa Clara, Town of	(NSFHA)
Franklin	Saranac Lake, Village of	1/2/1992
Franklin	Tupper Lake, Town of	(NSFHA)
Franklin	Tupper Lake,Village of	3/1/1987 (L)
Franklin	Waverly, Town of	(NSFHA)
Franklin	Westville, Town of	2/15/1985 (M)
Fulton	Bleecker,Town of	7/18/1985 (M)
Fulton	Broadalbin, Town of	1/3/1985 (M)
Fulton	Broadalbin, Village of	4/15/1986 (M)
Fulton	Caroga, Town of	7/18/1985 (M)
Fulton	Ephratah, Town of	7/3/1985 (M)
Fulton	Gloversville, City of	9/30/1983
Fulton	Johnstown, City of	7/18/1983
Fulton	Johnstown, Town of	7/3/1985 (M)

TABLE 3.4

Summary of FEMA Flood Insurance Rate Map (FIRM) Availability

County	Community Name	Current FIRM Effective Date
Fulton	Mayfield, Town of	8/5/1985 (M)
Fulton	Northampton, Town of	8/19/1985 (M)
Fulton	Northville, Village of	(NSFHA)
Fulton	Oppenheim, Town of	6/18/1976 (X)
Fulton	Perth, Town of	2/15/1985 (M)
Fulton	Stratford, Town of	1/3/1985 (M)
Genesee	Alabama, Town of	11/18/1983 (M)
Genesee	Alexander, Village of	5/4/1987
Genesee	Alexander,Town of	5/4/1987
Genesee	Batavia, City of	9/16/1982
Genesee	Batavia, Town of	1/17/1985
Genesee	Bergen, Town of	7/6/1984 (M)
Genesee	Bergen, Village of	6/8/1979 (M)
Genesee	Bethany, Town of	9/24/1984 (M)
Genesee	Byron, Town of	2/1/1988 (L)
Genesee	Corfu, Village of	10/15/1985 (M)
Genesee	Darien, Town of	7/6/1984 (M)
Genesee	Elba, Town of	10/5/1984 (M)
Genesee	Elba, Village of	1/20/1984 (M)
Genesee	Le Roy, Town of	9/14/1979 (M)
Genesee	Le Roy, Village of	8/3/1981
Genesee	Oakfield, Town of	5/25/1984 (M)
Genesee	Oakfield, Village of	3/23/1984 (M)
Genesee	Pavilion, Town of	2/27/1984 (M)
Genesee	Pembroke, Town of	1/20/1984 (M)
Genesee	Stafford,Town of	7/16/1982
Genesee/Wyoming	Attica, Village of	7/3/1986
Greene	Ashland, Town of	5/16/2008
Greene	Athens, Town of	5/16/2008
Greene	Athens, Village of	5/16/2008
Greene	Cairo, Town of	5/16/2008
Greene	Catskill, Town of	5/16/2008
Greene	Catskill, Village of	5/16/2008
Greene	Coxsackie, Town of	5/16/2008
Greene	Coxsackie, Village of	5/16/2008
Greene	Durham, Town of	5/16/2008 (M)
Greene	Greenville, Town of	5/16/2008 (M)
Greene	Halcott, Town of	5/16/2008 (M)
Greene	Hunter, Town of	5/16/2008
Greene	Hunter, Village of	5/16/2008
Greene	Jewett, Town of	5/16/2008
Greene	Lexington, Town of	5/16/2008
Greene	New Baltimore, Town of	5/16/2008 (M)
Greene	Prattsville, Town of	5/16/2008
Greene	Tannersville, Village of	5/16/2008
Greene	Windham, Town of	5/16/2008
Hamilton	Arietta, Town of	(NSFHA)
Hamilton	Benson, Town of	(NSFHA)
Hamilton	Hope, Town of	4/30/1986 (M)
Hamilton	Indian Lake, Town of	12/4/1985 (M)
Hamilton	Inlet, Town of	(NSFHA)

TABLE 3.4

Summary of FEMA Flood Insurance Rate Map (FIRM) Availability

County	Community Name	Current FIRM Effective Date
Hamilton	Lake Pleasant, Town of	(NSFHA)
Hamilton	Long Lake, Town of	9/24/1984 (M)
Hamilton	Morehouse, Town of	(NSFHA)
Hamilton	Speculator, Village of	2/6/1984 (M)
Hamilton	Wells, Town of	6/3/1986 (M)
Herkimer	Cold Brook, Village of	12/20/2000
Herkimer	Columbia, Town of	7/16/1982 (M)
Herkimer	Danube, Town of	5/12/1999 (M)
Herkimer	Dolgeville, Village of	3/16/1983
Herkimer	Fairfield, Town of	10/18/1988
Herkimer	Frankfort, Town of	12/20/2000
Herkimer	Frankfort, Village of	3/7/2001
Herkimer	German Flatts, Town of	5/15/1985 (M)
Herkimer	Herkimer, Town of	4/17/1985 (M)
Herkimer	Herkimer, Village of	6/17/2002
Herkimer	Ilion, Village of	9/8/1999
Herkimer	Litchfield, Town of	5/7/2001
Herkimer	Little Falls, City of	4/4/1983
Herkimer	Little Falls, Town of	3/28/1980 (M)
Herkimer	Manheim, Town of	5/1/1985 (M)
Herkimer	Middleville, Village of	7/3/1985 (M)
Herkimer	Mohawk, Village of	9/8/1999
Herkimer	Newport, Town of	6/2/1999
Herkimer	Newport, Village of	4/2/1991
Herkimer	Norway, Town of	7/3/1985 (M)
Herkimer	Ohio, Town of	9/24/1984 (M)
Herkimer	Poland, Village of	6/2/1999 (M)
Herkimer	Russia, Town of	6/2/1999
Herkimer	Salisbury, Town of	7/3/1985 (M)
Herkimer	Schuyler, Town of	6/20/2001
Herkimer	Stark, Town of	5/15/1985 (M)
Herkimer	Warren, Town of	(NSFHA)
Herkimer	Webb, Town of	7/30/1982 (M)
Herkimer	West Winfield, Village of	7/3/1985 (M)
Herkimer	Winfield, Town of	7/3/1985 (M)
Jefferson	Adams, Town of	6/5/1985 (M)
Jefferson	Adams, Village of	6/19/1985 (M)
Jefferson	Alexandria Bay, Village of	4/3/1978
Jefferson	Alexandria, Town of	10/15/1985 (M)
Jefferson	Antwerp, Town of	4/15/1986 (M)
Jefferson	Antwerp, Village of	(NSFHA)
Jefferson	Black River, Village of	6/5/1989 (M)
Jefferson	Brownville, Town of	6/2/1992
Jefferson	Brownville, Village of	3/18/1986 (M)
Jefferson	Cape Vincent, Town of	6/2/1992
Jefferson	Cape Vincent, Village of	4/17/1985 (M)
Jefferson	Carthage, Village of	6/17/1991
Jefferson	Champion, Town of	6/2/1993
Jefferson	Chaumont, Village of	9/8/1999
Jefferson	Clayton, Town of	4/2/1986
Jefferson	Clayton, Village of	12/1/1977

TABLE 3.4

Summary of FEMA Flood Insurance Rate Map (FIRM) Availability

County	Community Name	Current FIRM Effective Date
Jefferson	Deferiet, Village of	(NSFHA)
Jefferson	Dexter, Village of	6/15/1994
Jefferson	Ellisburg, Town of	5/18/1992
Jefferson	Ellisburg, Village of	6/19/1985 (M)
Jefferson	Evans Mills, Village of	1/2/1992
Jefferson	Glen Park, Village of	(NSFHA)
Jefferson	Henderson, Town of	5/18/1992
Jefferson	Herrings, Village of	12/18/1985
Jefferson	Hounsfield, Town of	5/18/1992
Jefferson	Leray, Town of	2/2/2002
Jefferson	Lyme, Town of	9/2/1993
Jefferson	Orleans, Town of	3/1/1978
Jefferson	Pamelia, Town of	1/2/1992
Jefferson	Philadelphia, Town of	6/5/1989 (M)
Jefferson	Philadelphia, Village of	9/15/1993
Jefferson	Rodman, Town of	7/3/1985 (M)
Jefferson	Rutland, Town of	8/18/1992
Jefferson	Sackets Harbor, Village of	5/2/1994
Jefferson	Theresa, Town of	10/15/1985 (M)
Jefferson	Theresa, Village of	10/15/1985 (M)
Jefferson	Watertown, City of	8/2/1993
Jefferson	Watertown, Town of	8/2/1993
Jefferson	West Carthage, Village of	9/28/1990
Jefferson	Wilna, Town of	1/16/1992
Jefferson	Worth, Town of	(NSFHA)
Lewis	Castorland, Village of	(NSFHA)
Lewis	Constableville, Village of	7/16/1982 (M)
Lewis	Copenhagen, Village of	(NSFHA)
Lewis	Crogham, Village of	5/15/1985 (M)
Lewis	Croghan, Town of	5/15/1985 (M)
Lewis	Denmark, Town of	5/15/1985 (M)
Lewis	Diana, Town of	9/24/1984 (M)
Lewis	Greig, Town of	5/15/1985 (M)
Lewis	Harrisburg, Town of	(NSFHA)
Lewis	Harrisville, Village of	9/24/1984 (M)
Lewis	Lewis, Town of	9/29/1996
Lewis	Leyden, Town of	6/19/1985 (M)
Lewis	Lowville, Town of	6/20/2000
Lewis	Lowville, Village of	6/20/2000
Lewis	Lyons Falls, Village of	6/19/1985 (M)
Lewis	Lyonsdale, Town of	6/19/1985 (M)
Lewis	Martinsburg, Town of	6/19/1985 (M)
Lewis	New Bremen, Town of	5/4/2000
Lewis	Osceola, Town of	6/30/1976 (M)
Lewis	Pinckney, Town of	(NSFHA)
Lewis	Port Leyden, Village of	6/19/1985 (M)
Lewis	Turin, Town of	8/2/1994
Lewis	Turin, Village of	7/1/1977 (M)
Lewis	Watson, Town of	7/19/2000
Lewis	West Turin, Town of	(NSFHA)
Livingston	Avon, Town of	8/15/1978

TABLE 3.4

Summary of FEMA Flood Insurance Rate Map (FIRM) Availability

County	Community Name	Current FIRM Effective Date
Livingston	Avon, Village of	8/1/1978
Livingston	Caledonia, Town of	6/1/1981
Livingston	Caledonia, Village of	6/1/1981
Livingston	Conesus, Town of	2/15/1991
Livingston	Dansville, Village of	11/1/1978
Livingston	Geneseo, Town of	9/29/1996
Livingston	Geneseo, Village of	9/29/1996
Livingston	Groveland, Town of	2/15/1991
Livingston	Leicester, Town of	1/20/1982
Livingston	Leicester, Village of	8/27/1982 (M)
Livingston	Lima, Town of	12/23/1983 (M)
Livingston	Lima, Village of	7/23/1982 (M)
Livingston	Livonia, Town of	2/19/1992
Livingston	Livonia, Village of	6/1/1988 (L)
Livingston	Mount Morris, Town of	(NSFHA)
Livingston	Mount Morris, Village of	8/1/1978
Livingston	North Dansville, Town of	12/4/1979
Livingston	Nunda, Town of	7/3/1985 (M)
Livingston	Nunda, Village of	3/23/1984 (M)
Livingston	Ossian, Town of	6/8/1984 (M)
Livingston	Portage,Town of	12/18/1984
Livingston	Sparta, Town of	8/27/1982 (M)
Livingston	Springwater, Town of	8/24/1984 (M)
Livingston	West Sparta, Town of	7/18/1985
Livingston	York, Town of	1/20/1982
Madison	Brookfield, Town of	4/17/1985 (M)
Madison	Canastota , Village of	4/15/1988
Madison	Cazenovia, Town of	6/19/1985
Madison	Cazenovia, Village of	6/19/1985
Madison	Chittenango, Village of	2/1/1985 (M)
Madison	De Ruyter, Town of	6/8/1984
Madison	De Ruyter, Village of	8/24/1984 (M)
Madison	Eaton, Town of	9/10/1984 (M)
Madison	Fenner, Township of	2/5/1986
Madison	Georgetown, Town of	11/2/1984 (M)
Madison	Hamilton, Town of	9/27/2002
Madison	Hamilton,Village	9/27/2002
Madison	Lebanon, Town of	4/17/1985 (M)
Madison	Lenox, Town of	6/3/1988
Madison	Lincoln, Town of	9/4/1985 (M)
Madison	Madison, Town of	1/19/1983
Madison	Morrisville, Village of	4/15/1982
Madison	Munnsville, Village of	9/15/1983
Madison	Nelson, Town of	10/5/1984 (M)
Madison	Oneida, City of	2/23/2001
Madison	Smithfield, Town of	4/17/1985 (M)
Madison	Stockbridge, Town of	(NSFHA)
Madison	Sullivan, Town of	5/15/1986
Madison	Wampsville, Village of	(NSFHA)
Monroe	Brighton, Town of	8/28/2008
Monroe	Brockport, Village of	8/28/2008 (M)

TABLE 3.4

Summary of FEMA Flood Insurance Rate Map (FIRM) Availability

County	Community Name	Current FIRM Effective Date
Monroe	Chili, Town of	8/28/2008
Monroe	Churchville, Village of	8/28/2008
Monroe	Clarkson, Town of	8/28/2008
Monroe	East Rochester, Village of	8/28/2008 (M)
Monroe	Fairport, Village of	8/28/2008
Monroe	Gates, Town of	8/28/2008
Monroe	Greece, Town of	8/28/2008
Monroe	Hamlin, Town of	8/28/2008
Monroe	Henrietta, Town of	8/28/2008
Monroe	Hilton, Village of	8/28/2008
Monroe	Honeoye Falls, Village of	8/28/2008
Monroe	Irondequoit, Town of	8/28/2008
Monroe	Mendon, Town of	8/28/2008
Monroe	Ogden, Town of	8/28/2008
Monroe	Parma, Town of	8/28/2008
Monroe	Penfield, Town of	8/28/2008
Monroe	Perinton, Town of	8/28/2008
Monroe	Pittsford, Town of	8/28/2008
Monroe	Pittsford, Village of	8/28/2008 (M)
Monroe	Riga, Town of	8/28/2008
Monroe	Rochester, City of	8/28/2008
Monroe	Rush, Town of	8/28/2008
Monroe	Scottsville, Village of	8/28/2008
Monroe	Spencerport, Village of	8/28/2008
Monroe	Sweden, Town of	8/28/2008 (M)
Monroe	Webster, Town of	8/28/2008
Monroe	Webster, Village of	8/28/2008
Monroe	Wheatland, Town of	8/28/2008
Montgomery	Ames, Village of	12/4/1985 (S)
Montgomery	Amsterdam, City of	6/19/1985
Montgomery	Amsterdam, Town of	12/1/1987 (L)
Montgomery	Canajoharie, Town of	1/6/1983
Montgomery	Canajoharie, Village of	11/3/1982
Montgomery	Charleston, Town of	10/15/1985 (M)
Montgomery	Florida, Town of	12/1/1987 (L)
Montgomery	Fonda, Village of	7/6/1983
Montgomery	Fort Johnson, Village of	1/19/1983
Montgomery	Fort Plain, Village of	6/17/2002
Montgomery	Fultonville, Village of	10/15/1982
Montgomery	Glen, Town of	2/19/1986 (M)
Montgomery	Hagaman, Village of	3/18/1986 (M)
Montgomery	Minden, Town of	1/19/1983
Montgomery	Mohawk, Town of	8/5/1985 (M)
Montgomery	Nelliston, Village of	11/3/1982 (S)
Montgomery	Palatine Bridge, Village of	11/17/1982
Montgomery	Palatine, Town of	5/4/1987
Montgomery	Root, Town of	4/1/1988 (L)
Montgomery	St. Johnsville, City of	9/29/1989
Montgomery	St. Johnsville, Town of	3/16/1983
Nassau	Atlantic Beach, Village of	9/11/2009 (>)
Nassau	Baxter Estates, Village of	9/11/2009 (>)

TABLE 3.4

Summary of FEMA Flood Insurance Rate Map (FIRM) Availability

County	Community Name	Current FIRM Effective Date
Nassau	Bayville, Village of	9/11/2009 (>)
Nassau	Cedarhurst, Village of	7/20/1998
Nassau	Centre Island, Village of	9/11/2009 (>)
Nassau	Cove Neck, Village of	9/11/2009 (>)
Nassau	East Hills, Village of	(NSFHA)
Nassau	East Rockaway, Village of	9/11/2009 (>)
Nassau	East Williston, Village of	(NSFHA)
Nassau	Floral Park, Village of	(NSFHA)
Nassau	Flower Hill, Village of	9/11/2009 (>)
Nassau	Freeport, Village of	9/11/2009 (>)
Nassau	Garden City, Village of	(NSFHA)
Nassau	Glen Cove, City of	9/11/2009 (>)
Nassau	Great Neck Estates, Village of	9/11/2009 (>)
Nassau	Great Neck Plaza, Village of	9/11/2009 (>)
Nassau	Great Neck, Village of	9/11/2009 (>)
Nassau	Hempstead, Town of	9/11/2009 (>)
Nassau	Hempstead, Village of	(NSFHA)
Nassau	Hewlett Bay Park, Village of	9/11/2009 (>)
Nassau	Hewlett Harbor, Village of	9/11/2009 (>)
Nassau	Hewlett Neck, Village of	9/11/2009 (>)
Nassau	Island Park, Village of	9/11/2009 (>)
Nassau	Kensington, Village of	9/11/2009 (>)
Nassau	Kings Point, Village of	9/11/2009 (>)
Nassau	Lake Success, Village of	(NSFHA)
Nassau	Lattingtown, Village of	9/11/2009 (>)
Nassau	Laurel Hollow, Village of	9/11/2009 (>)
Nassau	Lawrence, Village of	9/11/2009 (>)
Nassau	Long Beach, City of	9/11/2009 (>)
Nassau	Lynbrook, Village of	9/11/2009 (>)
Nassau	Malverne, Village of	9/11/2009 (>)
Nassau	Manorhaven, Village of	9/11/2009 (>)
Nassau	Massapequa Park, Village of	9/11/2009 (>)
Nassau	Mill Neck, Village of	9/11/2009 (>)
Nassau	Mineola, Village of	(NSFHA)
Nassau	Munsey Park, Village of	(NSFHA)
Nassau	New Hyde Park, Village of	(NSFHA)
Nassau	North Hempstead, Town of	9/11/2009 (>)
Nassau	North Hills, Village of	(NSFHA)
Nassau	Oyster Bay Cove, Village of	9/11/2009 (>)
Nassau	Oyster Bay, Town of	9/11/2009 (>)
Nassau	Plandome Heights, Village of	9/11/2009 (>)
Nassau	Plandome Manor, Village of	9/11/2009 (>)
Nassau	Plandome, Village of	9/11/2009 (>)
Nassau	Port Washington North, Village of	9/11/2009 (>)
Nassau	Rockville Centre, Village of	9/11/2009 (>)
Nassau	Roslyn Estates, Village of	(NSFHA)
Nassau	Roslyn Harbor, Village of	9/11/2009 (>)
Nassau	Roslyn, Village of	9/11/2009 (>)
Nassau	Russell Gardens, Village of	9/11/2009 (>)
Nassau	Saddle Rock, Village of	9/11/2009 (>)
Nassau	Sands Point, Village of	9/11/2009 (>)

TABLE 3.4

Summary of FEMA Flood Insurance Rate Map (FIRM) Availability

County	Community Name	Current FIRM Effective Date
Nassau	Sea Cliff, Village of	9/11/2009 (>)
Nassau	Stewart Manor, Village of	(NSFHA)
Nassau	Thomaston, Village of	9/11/2009 (>)
Nassau	Valley Stream, Village of	9/11/2009 (>)
Nassau	Westbury, Village of	(NSFHA)
Nassau	Woodsburgh, Village of	9/11/2009 (>)
Niagara	Barker, Village of	5/1/1984
Niagara	Cambria, Town of	9/30/1983
Niagara	Hartland, Town of	10/7/1983 (M)
Niagara	Lewiston, Town of	6/18/1980
Niagara	Lewiston, Village of	(NSFHA)
Niagara	Lockport, City of	2/4/1981
Niagara	Lockport, Town of	10/4/2002
Niagara	Middleport, Village of	8/1/1983
Niagara	Newfane, Town of	11/18/1981
Niagara	Niagara Falls, City of	9/5/1990
Niagara	Niagara, Town of	6/15/1984
Niagara	North Tonawanda, City of	1/6/1982
Niagara	Pendleton, Town of	1/6/1982
Niagara	Porter, Town of	8/15/1983
Niagara	Royalton, Town of	7/6/1979 (M)
Niagara	Somerset, Town of	2/3/1982
Niagara	Wheatfield, Town of	11/4/1992
Niagara	Wilson, Town of	4/1/1981
Niagara	Wilson, Village of	11/19/1980
Niagara	Youngstown, Village of	6/4/1980
Oneida	Annsville, Town of	4/5/1988
Oneida	Augusta, Town of	5/1/1985 (M)
Oneida	Ava, Town of	2/1/1985 (M)
Oneida	Barneveld, Village of	3/23/1999
Oneida	Boonville, Town of	7/3/1985 (M)
Oneida	Boonville, Village of	4/17/1985 (M)
Oneida	Bridgewater, Town of	(NSFHA)
Oneida	Bridgewater, Village of	4/15/1982
Oneida	Camden, Town of	9/7/1998
Oneida	Camden, Village of	8/16/1988
Oneida	Clayville, Village of	7/5/1983
Oneida	Clinton, Village of	5/1/1985
Oneida	Deerfield, Town of	6/2/1999
Oneida	Florence, Town of	4/17/1985 (M)
Oneida	Floyd, Town of	3/15/1984
Oneida	Forestport, Town of	4/17/1985 (M)
Oneida	Holland Patent, Village of	5/21/2001
Oneida	Kirkland, Town of	4/3/1985
Oneida	Lee, Town of	8/3/1998
Oneida	Marcy, Town of	6/1/1984
Oneida	Marshall, Town of	9/30/1982
Oneida	New Hartford, Town of	4/18/1983
Oneida	New Hartford, Village of	7/5/1983
Oneida	New York Mills, Village of	5/4/2000
Oneida	Oneida Castle, Village of	7/4/1989

TABLE 3.4

Summary of FEMA Flood Insurance Rate Map (FIRM) Availability

County	Community Name	Current FIRM Effective Date
Oneida	Oriskany Falls, Village of	1/19/1983
Oneida	Oriskany, Village of	9/15/1983
Oneida	Paris, Town of	9/15/1983
Oneida	Prospect, Village of	11/20/2000 (S)
Oneida	Remsen, Town of	5/1/1985 (M)
Oneida	Remsen, Village of	9/24/1984 (M)
Oneida	Rome, City of	9/21/1998
Oneida	Sangerfield, Town of	6/5/1985
Oneida	Sherrill, City of	9/15/1983
Oneida	Steuben, Town of	9/24/1984 (M)
Oneida	Sylvan Beach, Village of	6/2/1999
Oneida	Trenton, Town of	9/7/1998
Oneida	Utica, City of	2/1/1984
Oneida	Vernon, Town of	8/16/1988
Oneida	Vernon, Village of	4/15/1988
Oneida	Verona, Town of	10/20/1999
Oneida	Vienna, Town of	10/20/1999
Oneida	Waterville, Village of	8/2/1982
Oneida	Western, Town of	5/4/1989
Oneida	Westmoreland, Town of	3/2/1983
Oneida	Whitesboro, Village of	5/4/2000
Oneida	Whitestown, Town of	5/4/2000
Oneida	Yorkville, Village of	5/4/2000
Onondaga	Baldwinsville, Village of	3/1/1984
Onondaga	Camillus, Town of	5/18/1999
Onondaga	Camillus, Village of	5/18/1999
Onondaga	Cicero, Town of	9/15/1994
Onondaga	Clay, Town of	3/16/1992
Onondaga	Dewitt, Town of	3/1/1979
Onondaga	East Syracuse, Village of	8/3/1981
Onondaga	Elbridge, Town of	8/16/1982
Onondaga	Elbridge, Village of	8/16/1982
Onondaga	Fabius, Town of	4/30/1986 (M)
Onondaga	Fayetteville, Village of	4/17/1985
Onondaga	Geddes, Town of	2/17/1982
Onondaga	Jordan, Village of	8/16/1982
Onondaga	Lafayette, Town of	4/3/1985
Onondaga	Liverpool, Village of	2/4/1981
Onondaga	Lysander, Town of	2/4/1983
Onondaga	Manlius, Town of	9/17/1992
Onondaga	Manlius, Village of	8/1/1984
Onondaga	Marcellus, Town of	8/16/1982
Onondaga	Marcellus, Village of	6/1/1982
Onondaga	Minoa, Village of	9/2/1982
Onondaga	North Syracuse, Village of	(NSFHA)
Onondaga	Onondaga, Town of	6/17/1991
Onondaga	Otisco, Town of	6/3/1986 (M)
Onondaga	Pompey, Town of	10/8/1982
Onondaga	Salina, Town of	8/16/1982
Onondaga	Skaneateles, Town of	6/1/1982
Onondaga	Skaneateles, Village of	2/17/1982

TABLE 3.4

Summary of FEMA Flood Insurance Rate Map (FIRM) Availability

County	Community Name	Current FIRM Effective Date
Onondaga	Solvay, Village of	(NSFHA)
Onondaga	Spafford, Town of	4/30/1986 (M)
Onondaga	Syracuse, City of	5/15/1986
Onondaga	Tully, Town of	4/30/1986 (M)
Onondaga	Tully, Village of	1/19/1983
Onondaga	Van Buren, Town of	3/1/1984
Ontario	Bloomfield, Village of	1/1/1950
Ontario	Bristol, Town of	1/20/1984 (M)
Ontario	Canadice, Town of	5/15/1984
Ontario	Canandaigua, City of	9/24/1982
Ontario	Canandaigua, Town of	3/3/1997
Ontario	Clifton Springs, Village of	7/23/1982 (M)
Ontario	East Bloomfield, Town of	8/15/1983
Ontario	Farmington, Town of	9/30/1983
Ontario	Geneva, City of	4/15/1982
Ontario	Geneva, Town of	2/15/1978
Ontario	Gorham, Town of	12/5/1996
Ontario	Hopewell, Town of	2/27/1984 (M)
Ontario	Manchester, Town of	3/9/1984 (M)
Ontario	Manchester, Village of	1/20/1984 (M)
Ontario	Naples, Town of	6/8/1984 (M)
Ontario	Naples, Village of	9/30/1977
Ontario	Phelps, Town of	12/3/1982 (M)
Ontario	Phelps, Village of	1/20/1984 (M)
Ontario	Richmond, Town of	12/18/1984
Ontario	Seneca, Town of	6/22/1984 (M)
Ontario	Shortsville, Village of	9/24/1984 (M)
Ontario	South Bristol, Town of	5/18/1998
Ontario	Victor, Town of	9/30/1983
Ontario	Victor, Village of	5/17/2004
Ontario	West Bloomfield, Town of	6/1/1978
Orange	Blooming Grove, Town of	11/15/1985
Orange	Chester, Town of	6/4/1996
Orange	Chester, Village of	9/18/1986
Orange	Cornwall On The Hudson, Village of	8/2/1982
Orange	Cornwall, Town of	9/30/1982
Orange	Crawford, Town of	9/30/1982
Orange	Deer Park, Town of	10/20/1999
Orange	Florida, Village of	12/4/1986
Orange	Goshen, Town of	4/30/1986
Orange	Goshen, Village of	4/30/1986
Orange	Greenville, Town of	3/4/1985
Orange	Greenwood Lake, Village of	6/15/1979
Orange	Hamptonburgh, Town of	7/3/1986
Orange	Harriman, Village of	9/1/1983
Orange	Highland Falls, Village of	5/19/1987
Orange	Highlands, Township of	5/19/1987
Orange	Kiryas Joel, Village of	6/14/2002
Orange	Maybrook, Village of	1/1/1950
Orange	Middletown, City of	3/2/1983
Orange	Minisink, Town of	4/3/1985

TABLE 3.4

Summary of FEMA Flood Insurance Rate Map (FIRM) Availability

County	Community Name	Current FIRM Effective Date
Orange	Monroe, Town of	2/23/2001
Orange	Monroe, Village of	1/6/1982
Orange	Montgomery, Town of	10/16/1984
Orange	Montgomery, Village of	10/16/1984
Orange	Mount Hope, Town of	10/5/1984 (M)
Orange	New Windsor, Town of	12/15/1978
Orange	Newburgh, City of	6/5/1985
Orange	Newburgh, Town of	6/5/1985
Orange	Port Jervis, City of	4/2/2002
Orange	South Blooming Grove, Village of	1/1/1950
Orange	Tuxedo Park, Village of	1/1/1950
Orange	Tuxedo, Town of	4/15/1982
Orange	Unionville, Village of	7/6/1984 (M)
Orange	Walden, Village of	8/15/1984
Orange	Wallkill, Town of	9/4/1986
Orange	Warwick, Town of	10/15/1985
Orange	Warwick, Village of	2/17/1988
Orange	Washingtonville, Village of	4/1/1981
Orange	Wawayanda, Town of	3/4/1985
Orange	Woodbury, Village of	3/18/1987
Orleans	Albion, Town of	8/8/1980 (M)
Orleans	Albion, Village of	11/30/1979 (M)
Orleans	Barre, Town of	10/15/1981 (M)
Orleans	Carlton, Town of	11/1/1978
Orleans	Clarendon,Town of	(NSFHA)
Orleans	Gaines, Town of	6/8/1984 (M)
Orleans	Holley, Village of	11/30/1979 (M)
Orleans	Kendall, Town of	5/1/1978
Orleans	Lyndonville, Village of	9/16/1981
Orleans	Medina, Village of	3/28/1980 (M)
Orleans	Murray, Town of	3/21/1980 (M)
Orleans	Ridgeway,Town of	9/14/1979 (M)
Orleans	Shelby,Town of	12/23/1983 (M)
Orleans	Yates, Town of	9/29/1978
Oswego	Albion, Town of	4/15/1986 (M)
Oswego	Altmar, Village of	2/5/1986 (M)
Oswego	Amboy, Town of	3/1/1988 (L)
Oswego	Boylston, Town of	(NSFHA)
Oswego	Central Square,Village of	(NSFHA)
Oswego	Cleveland, Village of	6/1/1982
Oswego	Constantia, Town of	11/3/1982
Oswego	Fulton, City of	4/15/1982
Oswego	Granby, Town of	9/16/1982
Oswego	Hannibal, Town of	2/1/1988 (L)
Oswego	Hannibal, Village of	4/1/1987 (L)
Oswego	Hastings, Town of	1/19/1983
Oswego	Lacona, Village of	5/11/1979 (M)
Oswego	Mexico, Town of	10/15/1981
Oswego	Mexico, Village of	10/15/1981
Oswego	Minetto, Town of	9/30/1981
Oswego	New Haven, Town of	11/2/1995

TABLE 3.4

Summary of FEMA Flood Insurance Rate Map (FIRM) Availability

County	Community Name	Current FIRM Effective Date
Oswego	Orwell, Town of	2/19/1986 (S)
Oswego	Oswego, City of	11/22/1999
Oswego	Oswego, Town of	6/20/2001
Oswego	Palermo, Town of	3/1/1988 (S)
Oswego	Parish, Town of	4/15/1986 (M)
Oswego	Parish, Village of	2/19/1986 (M)
Oswego	Phoenix, Village of	2/17/1982
Oswego	Pulaski, Village of	9/2/1982
Oswego	Redfield, Town of	4/1/1991 (L)
Oswego	Richland, Town of	7/17/1995
Oswego	Sandy Creek, Town of	7/17/1995
Oswego	Sandy Creek, Village of	5/11/1979 (M)
Oswego	Schroeppel, Town of	8/2/1982
Oswego	Scriba, Town of	6/6/2001
Oswego	Volney, Town of	4/15/1982
Oswego	West Monroe, Town of	1/20/1982
Oswego	Williamstown, Town of	3/1/1988 (S)
Otsego	Burlington, Town of	10/21/1983 (M)
Otsego	Butternuts, Town of	12/23/1983 (M)
Otsego	Cherry Valley, Town of	2/1/1988 (L)
Otsego	Cherry Valley, Village of	1/3/1986 (M)
Otsego	Cooperstown, Village of	5/4/2000
Otsego	Decatur, Town of	6/18/1987
Otsego	Edmeston, Town of	6/1/1987 (L)
Otsego	Exeter, Town of	11/18/1983 (M)
Otsego	Gilbertsville, Village of	11/1/1985 (M)
Otsego	Hartwick, Town of	11/4/1983 (M)
Otsego	Laurens, Town of	5/15/1985 (M)
Otsego	Laurens, Village of	4/17/1987 (M)
Otsego	Maryland, Town of	6/3/1986 (M)
Otsego	Middlefield, Town of	6/1/1988 (L)
Otsego	Milford, Town of	5/19/1987 (M)
Otsego	Milford, Village of	11/18/1983 (S)
Otsego	Morris, Town of	1/3/1986 (M)
Otsego	Morris, Village of	12/4/1985 (M)
Otsego	New Lisbon, Town of	11/18/1983 (M)
Otsego	Oneonta, City of	9/29/1978
Otsego	Oneonta, Town of	10/17/1986
Otsego	Otego, Town of	2/4/1987
Otsego	Otego, Village of	11/5/1986
Otsego	Otsego, Town of	6/1/1987 (L)
Otsego	Pittsfield, Town of	11/4/1983 (M)
Otsego	Plainfield, Town of	11/4/1983 (M)
Otsego	Richfield Springs, Village of	1/3/1986 (M)
Otsego	Richfield, Town of	4/15/1986 (M)
Otsego	Roseboom, Town of	6/1/1988 (S)
Otsego	Springfield, Town of	6/1/1987 (L)
Otsego	Unadilla, Town of	9/30/1987
Otsego	Unadilla, Village of	9/30/1987
Otsego	Westford, Town of	6/1/1988 (L)
Otsego	Worcester, Town of	6/1/1988 (L)

TABLE 3.4

Summary of FEMA Flood Insurance Rate Map (FIRM) Availability

County	Community Name	Current FIRM Effective Date
Putnam	Brewster, Village of	9/18/1986
Putnam	Carmel,Town of	10/19/2001
Putnam	Cold Spring, Village of	3/15/1984
Putnam	Kent, Town of	9/4/1986
Putnam	Nelsonville, Village of	9/10/1984 (M)
Putnam	Patterson, Town of	7/3/1986
Putnam	Philipstown,Town of	6/18/1987
Putnam	Putnam Valley, Town of	6/20/2001
Putnam	Southeast, Town of	9/4/1986
Rensselaer	Berlin, Town of	8/17/1979 (M)
Rensselaer	Brunswick, Town of	12/6/2000
Rensselaer	Castleton-On-Hudson, Village of	11/15/1984
Rensselaer	East Greenbush, Town of	3/18/1980
Rensselaer	East Nassau, Village of	9/5/1984
Rensselaer	Grafton, Town of	10/13/1978 (M)
Rensselaer	Hoosick Falls, Village of	2/4/2005
Rensselaer	Hoosick, Town of	8/1/1987 (L)
Rensselaer	Nassau, Town of	9/5/1984
Rensselaer	Nassau, Village of	5/18/1979 (M)
Rensselaer	North Greenbush,Town of	6/18/1980
Rensselaer	Petersburg, Town of	9/1/1978 (M)
Rensselaer	Pittstown, Town of	9/5/1990
Rensselaer	Poestenkill, Town of	9/2/1981
Rensselaer	Rensselaer, City of	3/18/1980
Rensselaer	Sand Lake, Town of	5/15/1980
Rensselaer	Schaghticoke, Town of	7/16/1984
Rensselaer	Schaghticoke, Village of	6/5/1985
Rensselaer	Schodack, Town of	8/15/1984
Rensselaer	Stephentown, Town of	8/3/1981
Rensselaer	Troy, City of	3/18/1980
Rensselaer	Valley Falls, Village of	6/5/1985
Richmond/Queens/ New York/Kings/Bronx	New York, City of	9/5/2007
Rockland	Chestnut Ridge, Village of	9/16/1988
Rockland	Clarkstown, Town of	5/21/2001
Rockland	Grand View-On-Hudson, Village of	10/15/1981
Rockland	Haverstraw, Town of	1/6/1982
Rockland	Haverstraw, Village of	9/2/1981
Rockland	Hillburn, Village of	9/20/1996
Rockland	Kaser, Village of	1/1/1950
Rockland	Montebello, Village of	1/18/1989
Rockland	New Hempstead, Village of	12/16/1988
Rockland	New Square, Village of	(NSFHA)
Rockland	Nyack, Village of	12/4/1985
Rockland	Orangetown, Town of	8/2/1982
Rockland	Piermont, Village of	11/17/1982
Rockland	Pomona, Village of	4/15/1982
Rockland	Ramapo, Town of	2/2/1989
Rockland	Sloatsburg, Village of	1/6/1982
Rockland	South Nyack, Village of	11/4/1981
Rockland	Spring Valley, Village of	8/16/1988

TABLE 3.4

Summary of FEMA Flood Insurance Rate Map (FIRM) Availability

County	Community Name	Current FIRM Effective Date
Rockland	Stony Point, Town of	9/30/1981
Rockland	Suffern, Village of	3/28/1980
Rockland	Upper Nyack, Village of	(NSFHA)
Rockland	Wesley Hills, Village of	9/16/1988
Rockland	West Haverstraw, Village of	9/30/1981
Saratoga	Ballston Spa, Village of	8/16/1995
Saratoga	Ballston, Town of	8/16/1995
Saratoga	Charlton, Town of	8/16/1995
Saratoga	Clifton Park, Town of	8/16/1995
Saratoga	Corinth, Town of	8/16/1995
Saratoga	Corinth, Village of	8/16/1995
Saratoga	Day, Town of	(NSFHA)
Saratoga	Galway, Town of	8/16/1995
Saratoga	Greenfield, Town of	8/16/1995
Saratoga	Hadley, Town of	8/16/1995
Saratoga	Halfmoon, Town of	8/16/1995
Saratoga	Malta, Town of	8/16/1995
Saratoga	Mechanicville, City of	8/16/1995
Saratoga	Milton, Town of	8/16/1995
Saratoga	Moreau, Town of	8/16/1995
Saratoga	Northumberland, Town of	8/16/1995
Saratoga	Providence, Town of	8/16/1995
Saratoga	Round Lake, Village of	8/16/1995
Saratoga	Saratoga Springs, City of	8/16/1995
Saratoga	Saratoga, Town of	8/16/1995
Saratoga	Schuylerville, Village of	8/16/1995
Saratoga	South Glens Falls, Village of	8/16/1995
Saratoga	Stillwater, Town of	8/16/1995
Saratoga	Stillwater, Village of	8/16/1995
Saratoga	Victory, Village of	8/16/1995
Saratoga	Waterford, Town of	8/16/1995
Saratoga	Waterford, Village of	8/16/1995
Saratoga	Wilton,Town of	(NSFHA)
Schenectady	Delanson, Village of	5/25/1984 (M)
Schenectady	Duanesburg, Town of	2/17/1989
Schenectady	Glenville,Town of	5/4/1987
Schenectady	Niskayuna, Town of	3/1/1978
Schenectady	Princetown, Town of	7/1/1988 (L)
Schenectady	Rotterdam, Town of	6/15/1984
Schenectady	Schenectady, City of	9/30/1983
Schenectady	Scotia, Village of	6/1/1984
Schoharie	Blenheim, Town of	4/2/2004
Schoharie	Broome, Town of	4/2/2004
Schoharie	Carlisle, Town of	4/2/2004
Schoharie	Cobleskill, Town of	4/2/2004
Schoharie	Cobleskill, Village of	4/2/2004
Schoharie	Conesville, Town of	4/2/2004
Schoharie	Esperance, Town of	4/2/2004
Schoharie	Esperance, Village of	4/2/2004
Schoharie	Fulton, Town of	4/2/2004
Schoharie	Gilboa, Town of	4/2/2004

TABLE 3.4

Summary of FEMA Flood Insurance Rate Map (FIRM) Availability

County	Community Name	Current FIRM Effective Date
Schoharie	Jefferson, Town of	4/2/2004
Schoharie	Middleburgh, Town of	4/2/2004
Schoharie	Middleburgh, Village of	4/2/2004
Schoharie	Richmondville, Town of	4/2/2004
Schoharie	Richmondville, Village of	4/2/2004
Schoharie	Schoharie, Town of	4/2/2004
Schoharie	Schoharie, Village of	4/2/2004
Schoharie	Seward, Town of	4/2/2004
Schoharie	Sharon Spring, Village of	4/2/2004 (M)
Schoharie	Sharon, Town of	4/2/2004
Schoharie	Summit, Town of	4/2/2004
Schoharie	Wright, Town of	4/2/2004
Schuyler	Burdett, Village of	6/1/1988 (L)
Schuyler	Catharine, Town of	4/20/1984 (M)
Schuyler	Cayuta, Town of	9/24/1984 (M)
Schuyler	Dix, Town of	10/29/1982 (M)
Schuyler	Hector, Town of	7/20/1984 (M)
Schuyler	Montour Falls, Village of	9/15/1983
Schuyler	Montour, Town of	3/1/1988 (L)
Schuyler	Odessa, Village of	4/20/1984 (M)
Schuyler	Orange, Town of	4/20/1984 (M)
Schuyler	Reading, Town of	(NSFHA)
Schuyler	Tyrone, Town of	7/6/1984 (M)
Schuyler	Watkins Glen, Village of	7/17/1978
Seneca	Covert, Town of	6/8/1984 (M)
Seneca	Fayette, Town of	1/15/1988
Seneca	Lodi, Town of	1/15/1988
Seneca	Lodi, Village of	(NSFHA)
Seneca	Ovid, Town of	1/15/1988
Seneca	Romulus, Town of	6/5/1985 (M)
Seneca	Seneca Falls, Town of	8/3/1981
Seneca	Seneca Falls, Village of	8/3/1981
Seneca	Tyre, Town of	8/31/1979 (M)
Seneca	Varick, Town of	12/17/1987
Seneca	Waterloo, Town of	9/16/1981
Seneca	Waterloo, Village of	8/3/1981
St. Lawrence	Brasher, Town of	1/3/1986 (M)
St. Lawrence	Canton, Town of	8/17/1998
St. Lawrence	Canton, Village of	5/2/1994
St. Lawrence	Clare, Town of	7/16/1982 (M)
St. Lawrence	Clifton, City of	5/15/1986 (M)
St. Lawrence	Colton, Town of	5/1/1985 (M)
St. Lawrence	De Kalb, Town of	(NSFHA)
St. Lawrence	De Peyster, Town of	7/23/1982 (M)
St. Lawrence	Edwards, Town of	7/30/1982 (M)
St. Lawrence	Edwards, Village of	7/23/1982 (M)
St. Lawrence	Fine, Town of	5/1/1985 (M)
St. Lawrence	Fowler, Town of	6/5/1989 (M)
St. Lawrence	Gouverneur, Town of	8/6/1982 (M)
St. Lawrence	Gouverneur, Village of	3/3/1997
St. Lawrence	Hammond, Town of	(NSFHA)

TABLE 3.4

Summary of FEMA Flood Insurance Rate Map (FIRM) Availability

County	Community Name	Current FIRM Effective Date
St. Lawrence	Hermon, Town of	(NSFHA)
St. Lawrence	Hermon, Village of	8/3/1998
St. Lawrence	Heuvelton, Village of	4/30/1986 (M)
St. Lawrence	Hopkinton, Town of	11/12/1982 (M)
St. Lawrence	Lawrence, Town of	(NSFHA)
St. Lawrence	Lisbon, Town of	(NSFHA)
St. Lawrence	Louisville, Town of	(NSFHA)
St. Lawrence	Macomb, Town of	(NSFHA)
St. Lawrence	Madrid, Town of	(NSFHA)
St. Lawrence	Massena, Town of	6/17/1986 (M)
St. Lawrence	Massena, Village of	11/5/1980
St. Lawrence	Morristown, Town of	8/6/1982 (M)
St. Lawrence	Morristown, Village of	12/2/1980 (M)
St. Lawrence	Norfolk, Town of	4/15/1986 (M)
St. Lawrence	Norwood, Village of	4/30/1986 (M)
St. Lawrence	Ogdensburg, City of	11/5/1980
St. Lawrence	Oswegatchie, Town of	5/1/1985 (M)
St. Lawrence	Parishville, Town of	7/30/1982 (M)
St. Lawrence	Piercefield, Town of	1/6/1984 (M)
St. Lawrence	Pierrepont, Town of	(NSFHA)
St. Lawrence	Pitcairn, Town of	8/13/1982 (M)
St. Lawrence	Potsdam, Village of	1/5/1996
St. Lawrence	Potsdam,Town of	3/4/1986 (M)
St. Lawrence	Rensselaer Falls, Village of	1/6/1984 (M)
St. Lawrence	Richville, Village of	1/6/1984 (M)
St. Lawrence	Rossie, Town of	7/30/1982 (M)
St. Lawrence	Russell, Town of	(NSFHA)
St. Lawrence	Stockholm, Town of	4/15/1986 (M)
St. Lawrence	Waddington, Town of	4/15/1986 (M)
St. Lawrence	Waddington, Village of	5/11/1979 (M)
Steuben	Addison, Town of	12/18/1984
Steuben	Addison, Village of	6/15/1981
Steuben	Arkport, Village of	3/4/1980
Steuben	Avoca, Town of	2/5/1992
Steuben	Avoca, Village of	5/16/1983
Steuben	Bath, Town of	5/2/1983
Steuben	Bath, Village of	3/16/1983
Steuben	Bradford, Town of	9/24/1984 (M)
Steuben	Cameron, Town of	5/15/1991
Steuben	Campbell, Town of	6/11/1982
Steuben	Canisteo, Town of	12/18/1984
Steuben	Canisteo, Village of	5/18/1979 (M)
Steuben	Caton, Town of	3/23/1984 (M)
Steuben	Cohocton, Town of	5/16/1983
Steuben	Cohocton, Village of	5/16/1983
Steuben	Corning, City of	9/27/2002
Steuben	Corning, Town of	9/27/2002
Steuben	Dansville, Town of	3/9/1984 (M)
Steuben	Erwin, Town of	7/2/1980
Steuben	Fremont, Town of	10/29/1982 (M)
Steuben	Greenwood, Town of	9/3/1982 (M)

TABLE 3.4

Summary of FEMA Flood Insurance Rate Map (FIRM) Availability

County	Community Name	Current FIRM Effective Date
Steuben	Hammondsport, Village of	4/17/1978
Steuben	Hartsville, Town of	9/17/1982 (M)
Steuben	Hornby, Town of	4/15/1986
Steuben	Hornell, City of	3/18/1980
Steuben	Hornellsville, Town of	7/16/1980
Steuben	Howard, Town of	9/3/1982 (M)
Steuben	Jasper, Town of	7/23/1982 (M)
Steuben	Lindley, Town of	8/1/1980
Steuben	North Hornell, Village of	1/17/1986
Steuben	Painted Post, Village of	5/18/2000
Steuben	Prattsburg, Town of	1/20/1984 (M)
Steuben	Pulteney, Town of	9/30/1977
Steuben	Rathbone, Town of	12/3/1982 (M)
Steuben	Riverside, Village of	5/15/1980
Steuben	Savona, Village of	8/15/1980
Steuben	South Corning, Village of	10/15/1981
Steuben	Thurston, Town of	2/11/1983 (M)
Steuben	Troupsburg, Town of	9/24/1982 (M)
Steuben	Tuscarora, Town of	3/1/1988 (L)
Steuben	Urbana, Town of	1/19/1978
Steuben	Wayland, Town of	6/8/1984 (M)
Steuben	Wayland, Village of	8/1/1988 (L)
Steuben	Wayne, Town of	11/2/1977
Steuben	West Union, Town of	7/1/1988 (L)
Steuben	Wheeler, Town of	7/25/1980 (M)
Steuben	Woodhull, Town of	4/2/1991
Steuben/Allegany	Almond, Town of	3/4/1980
Suffolk	Amityville, Village of	5/4/1998
Suffolk	Asharoken, Village of	5/4/1998
Suffolk	Babylon, Village of	5/4/1998
Suffolk	Babylon,Town of	5/4/1998
Suffolk	Belle Terre, Village of	5/4/1998
Suffolk	Bellport, Village of	5/4/1998
Suffolk	Brightwaters, Village of	5/4/1998
Suffolk	Brookhaven,Town of	5/4/1998
Suffolk	Dering Harbor, Village of	5/4/1998
Suffolk	East Hampton,Town of	5/4/1998
Suffolk	East Hampton,Village of	5/4/1998
Suffolk	Greenport, Village of	5/4/1998
Suffolk	Head of The Harbor, Village of	5/4/1998
Suffolk	Huntington Bay, Village of	5/4/1998
Suffolk	Huntington, Town of	5/4/1998
Suffolk	Islandia, Village of	5/4/1998 (X)
Suffolk	Islip,Town of	5/4/1998
Suffolk	Lake Grove, Village of	(NSFHA)
Suffolk	Lindenhurst, Village of	5/4/1998
Suffolk	Lloyd Harbor, Village of	5/4/1998
Suffolk	Nissequogue, Village of	5/4/1998
Suffolk	North Haven, Village of	5/4/1998
Suffolk	Northport, Village of	5/4/1998
Suffolk	Ocean Beach, Village of	5/4/1998

TABLE 3.4

Summary of FEMA Flood Insurance Rate Map (FIRM) Availability

County	Community Name	Current FIRM Effective Date
Suffolk	Old Field, Village of	5/4/1998
Suffolk	Patchogue, Village of	5/4/1998
Suffolk	Poospatuck Indian Reservation	9/25/2009 (>)(X)
Suffolk	Poquott, Village of	5/4/1998
Suffolk	Port Jefferson, Village of	5/4/1998
Suffolk	Quogue, Village of	5/4/1998
Suffolk	Riverhead, Town of	5/4/1998
Suffolk	Sag Harbor, Village of	5/4/1998
Suffolk	Sagaponack, Village of	5/4/1998
Suffolk	Saltaire,Village of	5/4/1998
Suffolk	Shelter Island, Town of	5/4/1998
Suffolk	Shinnecock Indian Reservation	9/25/2009 (>)(X)
Suffolk	Shoreham, Village of	5/4/1998
Suffolk	Smithtown, Town of	5/4/1998
Suffolk	Southampton, Town of	5/4/1998
Suffolk	Southampton, Village of	5/4/1998
Suffolk	Southold,Town of	5/4/1998
Suffolk	The Branch, Village of	5/4/1998
Suffolk	West Hampton Dunes, Village of	5/4/1998
Suffolk	Westhampton Beach, Village of	5/4/1998
Sullivan	Bethel, Town of	2/27/1984 (M)
Sullivan	Bloomingburg, Village of	4/17/1985
Sullivan	Callicoon, Town of	3/23/1984 (M)
Sullivan	Cochecton, Town of	8/19/1987
Sullivan	Delaware, Town of	1/16/1987
Sullivan	Fallsburg, Town of	3/9/1984 (M)
Sullivan	Forestburgh, Town of	(NSFHA)
Sullivan	Fremont, Town of	4/3/1987
Sullivan	Highland, Town of	3/4/1987
Sullivan	Jeffersonville, Village of	7/16/1990
Sullivan	Liberty, Town of	6/5/1985
Sullivan	Liberty, Village of	2/1/1985
Sullivan	Lumberland, Town of	10/19/2001
Sullivan	Mamakating, Town of	9/30/1992
Sullivan	Monticello, Village of	(NSFHA)
Sullivan	Neversink, Town of	5/25/1984 (M)
Sullivan	Rockland, Town of	6/2/1993
Sullivan	Thompson, Town of	2/15/1991
Sullivan	Tusten, Town of	8/20/2002
Sullivan	Woodridge, Village of	6/25/1976 (M)
Sullivan	Wurtsboro, Village of	2/3/1993
Tioga	Barton, Town of	5/15/1991
Tioga	Berkshire, Town of	5/15/1985 (M)
Tioga	Candor, Town of	8/19/1986
Tioga	Candor, Village of	10/1/1991 (L)
Tioga	Newark Valley, Town of	2/3/1982
Tioga	Newark Valley, Village of	2/3/1982
Tioga	Nichols, Town of	2/17/1982
Tioga	Nichols, Village of	9/29/1986 (S)
Tioga	Owego, Town of	1/17/1997
Tioga	Owego, Village of	4/2/1982

TABLE 3.4

Summary of FEMA Flood Insurance Rate Map (FIRM) Availability

County	Community Name	Current FIRM Effective Date
Tioga	Richford, Town of	5/15/1985 (M)
Tioga	Spencer, Town of	5/15/1985 (M)
Tioga	Spencer, Village of	5/15/1985 (M)
Tioga	Tioga, Town of	5/17/1982
Tioga	Waverly, Village of	3/16/1983
Tompkins	Caroline, Town of	6/19/1985 (M)
Tompkins	Cayuga Heights, Village of	(NSFHA)
Tompkins	Danby, Town of	5/15/1985 (M)
Tompkins	Dryden, Town of	5/15/1985 (M)
Tompkins	Dryden, Village of	1/3/1979
Tompkins	Freeville, Village of	5/1/1988 (L)
Tompkins	Groton, Town of	10/5/1984 (M)
Tompkins	Groton, Village of	11/5/1986
Tompkins	Ithaca, City of	9/30/1981
Tompkins	Ithaca, Town of	6/19/1985
Tompkins	Lansing, Town of	10/15/1985
Tompkins	Lansing, Village of	11/19/1987
Tompkins	Newfield, Town of	10/15/1985 (M)
Tompkins	Trumansburg, Village of	4/1/1988 (L)
Tompkins	Ulysses, Town of	2/19/1987
Ulster	Denning, Town of	5/25/1984 (M)
Ulster	Ellenville, Village of	7/5/1983
Ulster	Esopus, Town of	7/5/1984
Ulster	Gardiner, Town of	7/16/1997
Ulster	Hardenburgh, Town of	3/16/1989
Ulster	Hurley, Town of	8/18/1992
Ulster	Kingston, City of	5/1/1985
Ulster	Kingston,Town of	4/5/1988
Ulster	Lloyd, Town of	7/5/2000
Ulster	Marbletown, Town of	8/5/1991
Ulster	Marlborough, Town of	12/5/1984
Ulster	New Paltz, Town of	11/1/1985
Ulster	New Paltz, Village of	10/15/1985
Ulster	Olive, Town of	11/1/1984
Ulster	Plattekill, Town of	(NSFHA)
Ulster	Rochester, Town of	2/6/1991
Ulster	Rosendale, Town of	11/1/1985
Ulster	Saugerties, Town of	9/30/1992
Ulster	Saugerties, Village of	8/5/1985 (M)
Ulster	Shandaken, Town of	2/17/1989
Ulster	Shawangunk, Town of	9/30/1982
Ulster	Ulster, Town of	5/1/1985
Ulster	Wawarsing, Town of	9/15/1983
Ulster	Woodstock, Town of	9/27/1991
Warren	Bolton, Town of	8/16/1996
Warren	Chester, Town of	6/5/1985 (M)
Warren	Glens Falls, City of	6/5/1985
Warren	Hague, Town of	9/29/1996
Warren	Horicon, Town of	2/15/1985 (M)
Warren	Johnsburg, Town of	5/1/1985 (M)
Warren	Lake George, Town of	8/16/1996

TABLE 3.4

Summary of FEMA Flood Insurance Rate Map (FIRM) Availability

County	Community Name	Current FIRM Effective Date
Warren	Lake George, Village of	9/29/1996
Warren	Lake Luzerne, Town of	5/1/1984
Warren	Queensbury, Town of	8/16/1996
Warren	Stony Creek, Town of	8/24/1984 (M)
Warren	Thurman, Town of	8/19/1986
Warren	Warrensburg, Town of	3/1/1984
Washington	Argyle, Town of	8/24/1979 (M)
Washington	Argyle, Village of	5/18/1979 (M)
Washington	Cambridge, Town of	9/4/1985 (M)
Washington	Cambridge, Village of	1/2/2008
Washington	Dresden, Town of	9/20/1996
Washington	Easton, Town of	11/20/1991
Washington	Fort Ann, Town of	11/5/1997
Washington	Fort Ann, Village of	(NSFHA)
Washington	Fort Edward, Town of	12/15/1982
Washington	Fort Edward, Village of	2/15/1984
Washington	Granville, Town of	8/5/1985 (M)
Washington	Granville, Village of	4/17/1985 (M)
Washington	Greenwich, Village of	5/4/2000
Washington	Greenwich,Town of	3/16/1992
Washington	Hampton, Town of	4/17/1985 (M)
Washington	Hartford, Town of	11/1/1985 (M)
Washington	Hebron, Town of	6/15/1994
Washington	Hudson Falls, Village of	(NSFHA)
Washington	Jackson, Town of	3/16/1992
Washington	Kingsbury, Town of	9/7/1979 (M)
Washington	Putnam, Town of	11/20/1996
Washington	Salem, Village of	4/17/1985 (M)
Washington	Salem,Town of	4/17/1985 (M)
Washington	White Creek, Town of	4/17/1985 (M)
Washington	Whitehall, Town of	7/3/1986
Washington	Whitehall, Village of	6/3/1985 (M)
Wayne	Arcadia, Town of	11/2/1977
Wayne	Butler, Town of	7/9/1982 (M)
Wayne	Clyde, Village of	12/18/1984
Wayne	Galen, Town of	5/16/1983
Wayne	Huron, Town of	1/19/1996
Wayne	Lyons, Town of	9/7/1979 (M)
Wayne	Lyons, Village of	3/16/1983
Wayne	Macedon, Town of	1/5/1984
Wayne	Macedon, Village of	9/30/1983
Wayne	Marion, Town of	7/1/1988 (L)
Wayne	Newark, Village of	7/15/1988
Wayne	Ontario, Town of	6/1/1978
Wayne	Palmyra, Town of	3/1/1978
Wayne	Palmyra, Village of	7/15/1988
Wayne	Red Creek, Village of	4/8/1983 (M)
Wayne	Rose, Town of	3/9/1984 (M)
Wayne	Savannah, Town of	8/6/1982 (M)
Wayne	Sodus Point, Village of	11/2/1977
Wayne	Sodus, Town of	6/2/1992

TABLE 3.4

Summary of FEMA Flood Insurance Rate Map (FIRM) Availability

County	Community Name	Current FIRM Effective Date
Wayne	Walworth, Town of	3/16/1983
Wayne	Williamson Town	10/17/1978
Wayne	Wolcott, Town of	6/2/1992
Wayne	Wolcott, Village of	7/6/1984 (M)
Westchester	Ardsley, Village of	9/28/2007
Westchester	Bedford, Town of	9/28/2007
Westchester	Briarcliff Manor, Village of	9/28/2007
Westchester	Bronxville, Village of	9/28/2007
Westchester	Buchanan, Village of	9/28/2007 (M)
Westchester	Cortlandt, Town of	9/28/2007
Westchester	Croton-On-Hudson, Village of	9/28/2007
Westchester	Dobbs Ferry, Village of	9/28/2007
Westchester	Eastchester, Town of	9/28/2007
Westchester	Elmsford, Village of	9/28/2007
Westchester	Greenburgh,Town of	9/28/2007
Westchester	Harrison, Town of	9/28/2007
Westchester	Hastings-On-Hudson, Village of	9/28/2007
Westchester	Irvington, Village of	9/28/2007
Westchester	Larchmont, Village of	9/28/2007
Westchester	Lewisboro, Town of	9/28/2007 (M)
Westchester	Mamaroneck, Town of	9/28/2007
Westchester	Mamaroneck, Village of	9/28/2007
Westchester	Mount Kisco, Village of	9/28/2007
Westchester	Mount Pleasant, Town of	9/28/2007
Westchester	Mount Vernon, City of	9/28/2007
Westchester	New Castle, Town of	9/28/2007
Westchester	New Rochelle, City of	9/28/2007
Westchester	North Castle, Town of	9/28/2007
Westchester	North Salem, Town of	9/28/2007
Westchester	Ossining, Town of	9/28/2007
Westchester	Ossining, Village of	9/28/2007
Westchester	Peekskill, City of	9/28/2007
Westchester	Pelham Manor, Village of	9/28/2007
Westchester	Pelham, Village of	9/28/2007
Westchester	Pleasantville, Village of	9/28/2007
Westchester	Port Chester, Village of	9/28/2007
Westchester	Pound Ridge, Town of	9/28/2007
Westchester	Rye Brook, Village of	9/28/2007
Westchester	Rye, City of	9/28/2007
Westchester	Scarsdale, Village of	9/28/2007
Westchester	Sleepy Hollow, Village of	9/28/2007
Westchester	Somers, Town of	9/28/2007
Westchester	Tarrytown, Village of	9/28/2007
Westchester	Tuckahoe, Village of	9/28/2007
Westchester	White Plains, City of	9/28/2007
Westchester	Yonkers, City of	9/28/2007
Westchester	Yorktown, Town of	9/28/2007
Wyoming	Arcade, Town of	3/3/1992
Wyoming	Arcade, Village of	3/3/1992
Wyoming	Attica, Town of	4/30/1986
Wyoming	Bennington, Town of	12/23/1983 (M)

TABLE 3.4

Summary of FEMA Flood Insurance Rate Map (FIRM) Availability

County	Community Name	Current FIRM Effective Date
Wyoming	Castile, Town of	12/23/1983 (M)
Wyoming	Castile, Village of	5/28/1982 (M)
Wyoming	Covington, Town of	12/23/1983 (M)
Wyoming	Eagle, Town of	12/23/1983 (M)
Wyoming	Gainesville, Town of	12/23/1983 (M)
Wyoming	Gainesville, Village of	2/15/1985 (M)
Wyoming	Genesee Falls, Town of	5/1/1984
Wyoming	Java, Town of	12/23/1983 (M)
Wyoming	Orangeville, Town of	12/23/1983 (M)
Wyoming	Perry, Town of	12/23/1983 (M)
Wyoming	Perry, Village of	7/29/1977 (M)
Wyoming	Pike, Town of	12/23/1983 (M)
Wyoming	Pike, Village of	6/18/1982 (M)
Wyoming	Sheldon, Town of	12/23/1983 (M)
Wyoming	Silver Springs, Village of	1/20/1984 (M)
Wyoming	Warsaw, Town of	12/23/1983 (M)
Wyoming	Warsaw, Village of	11/18/1981
Wyoming	Wethersfield, Town of	7/16/1982 (S)
Wyoming	Wyoming, Village of	8/3/1981
Yates	Barrington, Town of	3/9/1984 (M)
Yates	Benton, Town of	1/20/1984 (M)
Yates	Dresden, Village of	6/15/1981
Yates	Dundee, Village of	3/1/1988 (L)
Yates	Italy, Town of	3/7/2001
Yates	Jerusalem, Town of	1/20/1984 (M)
Yates	Middlesex, Town of	9/29/1989
Yates	Milo, Town of	7/18/1985 (M)
Yates	Penn Yan, Village of	6/15/1981
Yates	Potter, Town of	3/23/1984 (M)
Yates	Rushville, Village of	6/5/1985 (M)
Yates	Starkey, Town of	12/3/1987
Yates	Torrey, Town of	12/3/1987

Notes:
(NSFHA) - No special flood hazard area - All Zone "C"
(M) No elevation determined - All Zone "A", "C", and "X"
(L) Original FIRM by letter - All Zone "A", "C", and "X"
(S) Suspended community, not in the National Flood Program.
(X) Community not in National Flood Program
(>) Date of current effective map is after the date of this report.
Source: FEMA "Community Status Book Report – July 23, 2009."
(http://www.fema.gov/fema/csb.shtm)

New York State

DEC

Division of Mineral Resources

Appendix 2

1992 SEQRA Findings Statement On the GEIS on the Oil, Gas and Solution Mining Regulatory Program

Draft Supplemental Generic Environmental Impact Statement

September 1, 1992

Findings Statement

Pursuant to the State Environmental Quality Review Act (SEQR) of the Environmental Conservation Law (ECL) and the SEQR Regulations 6NYCRR Part 617, the New York State Department of Environmental Conservation makes the following findings.

Name of Action

Adoption of the Final Generic Environmental Impact Statement (GEIS) on the Oil, Gas and Solution Mining Regulatory Program.

Description and Background

In early 1988, the Department of Environmental Conservation released the Draft GEIS on the Oil, Gas and Solution Mining Regulatory Program. The Draft GEIS comprehensively reviewed the environmental impacts of the Department's program for regulating the siting, drilling, production and plugging and abandonment of oil, gas, underground gas storage, solution mining, brine disposal, geothermal and stratigraphic test wells. Six public hearings were held on the Draft GEIS in June 1988.

The Final GEIS was released in July 1992. It contains individual responses to the hundreds of comments received on the Draft GEIS. The Final GEIS also includes more detailed topical responses addressing several controversial issues that frequently appeared in the comments on the draft document.

Together, the Draft and Final GEIS and this Findings Statement will provide the groundwork for revisions to the Oil, Gas and Solution Mining Regulations (6NYCRR Parts 550-559). These regulations are being updated to more accurately reflect and effectively implement the current Oil, Gas and Solution Mining Law (ECL Article 23).

The Draft GEIS included suggested changes to the regulations in bold print throughout the document. In the interests of environmental protection and public safety, a significant

number of the suggested regulatory changes are already put in effect as standard conditions routinely applied to permits. All formal regulation changes, however, must be promulgated in accordance with the State Administrative Procedure Act (SAPA) requiring separate review, public hearings and approval. Further public input during the rulemaking process may cause some of the new regulations, when they are eventually adopted, to differ from those discussed in the GEIS. Any regulations adopted that differ significantly from those discussed in the GEIS will undergo an additional SEQR Review and Determination.

Location

Statewide.

DEC Jurisdiction

Jurisdiction is provided by the Oil, Gas and Solution Mining Law (ECL Article 23).

Date Final GEIS Filed

The Final GEIS was filed June 25, 1992/#PO-009900-00046. The Notice of Completion was published in the Environmental Notice Bulletin July 8, 1992.

Facts and Conclusions Relied Upon to Support the SEQR Findings

The record of facts established in the Draft and Final GEIS upholds the following conclusions:

1. The **unregulated** siting, drilling, production, and plugging and abandonment of oil, gas, solution mining, underground gas storage, brine disposal, geothermal and stratigraphic test wells could have potential negative impacts on every aspect of the environment. The potential negative impacts range from very minor to significant. Potential impacts of **unregulated** activities on ground and surface waters are a particularly serious concern. The potential negative impacts on all environmental resources are described in detail in Chapters 8 through 14 and summarized in Chapter 16 of the Draft GEIS.

2. Under **existing regulations and permit conditions**, the potential environmental impacts of the above wells are **greatly reduced** and most are reduced to non-significant levels. The extensive mitigation measures required under the existing regulatory program are described in detail in Chapters 8 through 14 and summarized in Chapter 17 of the Draft GEIS.

3. The potential environmental impacts associated with the activities covered by the Oil, Gas and Solution Mining Regulatory Program also have economic and social implications. For example, it is less expensive to prevent pollution than pay for remediation of environmental problems, health care costs, and lawsuit expenses. The State also receives significant economic benefits from the activities covered by the regulatory program. The regulated industries provide jobs and economic stimulus through the purchase of goods and services, and the payment of taxes, royalties and leasing bonuses. Additional information on the potential economic impacts associated with the activities covered by the regulatory program is provided in Chapter 18 of the Draft GEIS.

4. The Department's routine requirement of: 1) a program-specific Environmental Assessment Form (EAF) with <u>every</u> well drilling permit application, 2) a plat (map) showing the proposed well location, and 3) a pre-drilling site inspection, allows the Department to:

   - reliably determine potential environmental problems, and
   - select appropriate permit conditions for mitigating potential environmental impacts.

   The EAF is printed in its entirety and discussed in detail on pages FGEIS 30-34 of the Final GEIS. Information on the permit application review process is summarized in Chapter 7 of the Draft GEIS.

5. The majority of the industry's activity centers on drilling individual oil and gas wells for primary production. For purposes of this Findings Statement, standard oil and gas operations are defined as:

   - any procedure relevant to rotary or cable tool drilling procedures, and
   - production operations which do not utilize any type of artificial means to facilitate the recovery of hydrocarbons.

   The basic features of standard oil and gas operations are described in detail in Chapters 9 through 11 of the Draft GEIS.

6. The diverse types of wells covered by the regulatory program have enough design and operational characteristics in common to group them according to their potential environmental impacts. Design and operational aspects of these wells are described in detail in Chapters 9 through 14 of the Draft GEIS.

7. The magnitude of potential environmental impacts associated with any proposed well covered by the regulatory program is strongly influenced by the types of natural and cultural resources in the well's vicinity. New York State's environmental resources are described in Chapter 6 of the Draft GEIS. Most of the information on the potential environmental impacts of the regulated activities on these environmental resources can be found in Chapter 8 of the Draft GEIS, which deals with siting issues. Additional information on potential impacts related to specific stages (drilling, completion, production, plugging and abandonment) of well operation can be found in Chapters 9 through 11 of the Draft GEIS. Additional information on potential environmental impacts related specifically to enhanced oil recovery, solution salt mining, underground gas storage and waste brine disposal can be found in Chapters 12 through 15 of the Draft GEIS.

8. The range of future alternatives concerning the activities covered by the Oil, Gas and Solution Mining Regulatory Program can be divided into three basic categories: 1) prohibition on regulated activities, 2) removal of regulation, and 3) maintenance of status quo versus revision of existing regulations. A prohibition on these regulated activities would deprive the State of substantial economic and natural resource benefits. Complete removal of regulation would lead to severe environmental problems. While the existing regulations and permit conditions provide significant environmental protection, there is still room to improve the efficiency and effectiveness of the program. Revision of the existing regulations is the best alternative. Chapter 21 of the Draft GEIS contains a more detailed assessment of the environmental, economic, and social aspects of each alternative.

SEQR Determinations of Significance

The SEQR determinations on the significance of the environmental impacts associated with the activities covered by this regulatory program are presented in the following table. The determinations are supported by the conclusions listed above, which in turn are supported by the referenced sections of the Draft and Final GEIS.

SEQR DETERMINATIONS

Agency Action	Environmental Impact	Explanation
a. Standard individual oil, gas, solution mining, stratigraphic, geothermal, or gas storage well drilling permits (no other permits involved).	not significant	Rules and regulations and conditions are adequate to protect the environment. The Draft and Final GEIS satisfy SEQR for these actions. A site-specific EAF is required with the permit application.
b. Oil and gas drilling permits in State Parklands.	may be significant	Site-specific conditions of State Parklands are not discussed in the Draft and Final GEIS. Further determination of significant environmental impacts is needed for State Parklands. A site-specific EAF is required with the permit application.
c. Oil and gas drilling permits in Agricultural Districts.	may be significant	Rules and regulations and conditions are adequate to protect the environment. For most oil and gas operations in Agricultural Districts which utilize less than 2½ acres the GEIS satisfies SEQR. If more than 2½ acres are disturbed, this is a Type I action under 6NYCRR Part 617 and an additional determination of significance is required. A site-specific EAF is required with the permit application.
d. Oil and gas drilling permits in the "Bass Island" fields.	not significant	Special conditions and regulations under Part 559 are adequate to protect the environment. The Draft and Final GEIS satisfy SEQR for these actions. A site-specific EAF is required with the permit application.

e. Oil and gas drilling permits for locations above aquifers.	not significant	Rules and regulations and special aquifer conditions employed by DEC have been developed specifically to protect the groundwater resources of the State. The Draft and Final GEIS satisfy SEQR for these actions. A site-specific EAF is required with the permit application.
f. Oil and gas drilling permits in close proximity (less than 1,000 feet) to municipal water supply wells.	always significant	A supplemental EIS is required dealing with the groundwater hydrology, potential impacts and mitigation measures. A site-specific EAF is required with the permit application.
g. Oil and gas drilling permits in proximity (between 1,000 and 2,000 feet) to municipal water supply wells.	may be significant	A supplemental EIS may be required dealing with the groundwater hydrology, potential impacts and mitigation measures. A site-specific assessment and SEQR determination are required. A site-specific EAF is required with the permit application.
h. Oil and gas drilling permits when other DEC permits required.	may be significant	A site-specific SEQR assessment and determination are needed based on the environmental conditions requiring additional DEC permits. A site-specific EAF is required with the permit application.
i. Plugging permits for oil, gas, solution mining, stratigraphic, geothermal, gas storage and brine disposal wells.	Type II *	By law all wells drilled must be plugged before abandonment. Proper well plugging is a beneficial action with the sole purpose of environmental protection, and constitutes a routine agency action.
* Under 6NYCRR 617.13, a Type II action is one which has been determined not to have a significant effect on the environment and does not require any other SEQR determination or procedure.		

j. New waterflood or tertiary recovery projects.	may be significant	For major new waterfloods and new tertiary recovery projects, a site specific environmental assessment and SEQR determination are required. A supplemental EIS may be required for new waterfloods to ensure integrity of the flood. Also, a supplemental EIS may be required for new tertiary recovery projects depending on the scope of operations and methods used. A site-specific EAF is required with the permit application.
k. New underground gas storage projects or major modifications.	may be significant	A site-specific environmental assessment and SEQR determination are required. May require a supplemental EIS depending on the scope of the project. A site-specific EAF is required with the permit application.
l. New solution mining projects or major modifications.	may be significant	A site-specific environmental assessment and SEQR determination are required. May require a supplemental EIS depending on the scope of the project. A site-specific EAF is required with the permit application.
m. Spacing hearing.	not significant	Action to hold hearing is non-significant. A review and SEQR determination with respect to all other issues must be made before the hearing. Any permit issued subsequently will be reviewed on issues raised at hearing. A site-specific EAF is required with the permit application.
n. Variance hearing.	not significant	Action to hold hearing is non-significant. A review and SEQR determination with respect to all other issues must be made before the hearing. Any permit issued subsequently will be reviewed on issues raised at hearing. A site-specific EAF is required with the permit application.

o. Compulsory unitization hearing.	not significant	Action to hold hearing is non-significant. A review and SEQR determination with respect to all other issues must be made before the hearing. Any permit issued subsequently will be reviewed on issues raised at hearing. A site-specific EAF is required with the permit application.
p. Natural Gas Policy Act pricing recommendations.	none	Action only results in recommendations to Federal Energy Regulatory Commission; therefore, action is not subject to SEQR.
q. Brine disposal well drilling or conversion permit.	may be significant	The brine disposal well permitting guidelines require an extensive surface and subsurface evaluation which is in effect a supplemental EIS addressing technical issues. An additional site specific environmental assessment and SEQR determination are required. A site-specific EAF is required with the permit application.

SEQR Review Procedures

Upon filing of this Findings Statement, the following SEQR Review procedures will be adopted for the Oil, Gas and Solution Mining Regulatory Program:

1. A shortened program-specific Environmental Assessment Form (EAF) will continue to be required with every well drilling permit application, regardless of the SEQR determination listed in the previous table. Information required by the EAF is considered to be an essential part of the permit application. It contains vital site-specific information necessary to evaluate the need for individual permit conditions.

2. In the following cases where the GEIS satisfies SEQR, Department staff will no longer make Determinations of Significance and a Negative or Positive Declaration under SEQR will no longer be required so long as projects conform to the descriptions in the Draft and Final GEIS:

   - Standard individual oil, gas, solution mining, stratigraphic test, geothermal or gas storage well drilling permits,
   - Oil and gas drilling permits in the "Bass Islands" field, and
   - Oil and gas drilling permits for locations above aquifers.

3. In addition to the short program-specific EAF, permits for the following projects will also require detailed site-specific environmental assessments using the Long-Form EAF published in Appendix A of 6NYCRR Part 617. A site or project-specific EIS may also be required for the following projects depending upon the information revealed in the permit application and accompanying EAF's:

   - Oil and gas drilling permits in Agricultural Districts if more than two and one-half acres will be altered by construction of the well site and access road.
   - Oil and gas drilling permits in State Parklands.
   - Oil and gas drilling permits when other DEC permits are required.

- Oil and gas drilling permits less than 2,000 feet from a municipal water supply well.
- New major waterflood or tertiary recovery projects.
- New underground gas storage projects or major modifications.
- New solution mining projects or major modifications.
- Brine disposal well drilling or conversion permits.
- Any other project not conforming to the standards, criteria or thresholds required by the Draft and Final GEIS.

Other SEQR Considerations

In conducting SEQR reviews, the Department will handle the topics of individual project scope, project size, lead agency, and coastal resources as described below.

1. Project scope - Each application to drill a well will continue to be considered as an individual project. An applicant applying for five wells will continue to be treated the same as five applicants applying to the Department individually, since the wells may not be drilled at the same time or in the same area. Planned future wells might not be drilled at all depending on the results of the first well drilled.

   The exceptions to this are proposed new or major expansions of solution mining, enhanced recovery or underground gas storage operations which require that several wells be drilled and operated for an extended period of time within a limited area.

2. Size of Project - The size of the project will continue to be defined as the surface acreage affected by development.

3. Lead Agency - In 1981, the Legislature gave exclusive authority to the Department to regulate the oil, gas and solution mining industries under ECL Section 23-0303(2). Thus, only the Department has jurisdiction to grant drilling permits for wells subject to Article 23, except within State parklands. To the extent practicable, the Department will actively seek lead agency designation consistent

with the general intent of Chapter 846 of the Laws of 1981.

4. Coastal Resources - On the program specific EAF that must accompany every drilling permit application, the applicant must indicate whether the proposed well is in a legally designated New York State Coastal Zone Management (CZM) Area. Neither the policies in the New York State CZM Plan, nor the provisions of individual Local Waterfront Revitalization Plans (LWRP's) are covered in the GEIS. Once an LWRP is adopted by a community, it is a legally binding part of the New York State CZM Plan. The Department cannot issue any drilling permit unless it is consistent with the New York State CZM Plan to the "maximum extent practicable."

CERTIFICATION OF FINDINGS TO ADOPT THE FINAL GENERIC ENVIRONMENTAL IMPACT STATEMENT ON THE OIL, GAS AND SOLUTION MINING REGULATORY PROGRAM

Having considered the Draft and Final GEIS, and having considered the preceding written facts and conclusions relied upon to meet the requirements of 6NYCRR Part 617.9, this Statement of Findings certifies that:

1. The requirements of 6NYCRR Part 617 have been met;

2. Consistent with the social, economic and other essential considerations from among the reasonable alternatives thereto, the action approved is one which minimizes or avoids adverse environmental effects to the maximum extent practicable; including the effects disclosed in the environmental impact statement, and

3. Consistent with social, economic and other essential considerations, to the maximum extent practicable, adverse environmental effects revealed in the environmental impact statement process will be minimized or avoided by incorporating as conditions to the decision those mitigative measures which were identified as practicable.

4. Consistent with the applicable policies of Article 42 of the Executive Law, as implemented by 19 NYCRR 600.5, this action will achieve a balance between the protection of the environment and the need to accommodate social and economic considerations.

Gary A. Amos — Director, Division of Mineral Resources

Sept. 29, 1992 — Date

New York State

DEC

Division of Mineral Resources

Appendix 3

Supplemental SEQRA Findings Statement on Leasing of State Lands for Activities Regulated Under the Oil, Gas and Solution Mining Law

Draft Supplemental Generic Environmental Impact Statement

SEQR File No.

P0-009900-00046

Supplemental
Findings Statement

Pursuant to the State Environmental Quality Review Act (SEQR) of the Environmental Conservation Law (ECL) and the SEQR Regulations 6NYCRR Part 617, the New York State Department of Environmental Conservation makes the following supplemental findings on the Final Generic Environmental Impact Statement (GEIS) on the Oil, Gas and Solution Mining Regulatory Program.

Name of Action

Adoption of supplemental findings on leasing of state lands for activities regulated under the Oil, Gas and Solution Mining Law (ECL Article 23).

Description and Background

In early 1988, the Department of Environmental Conservation released the Draft GEIS on the Oil, Gas and Solution Mining Regulatory Program. The Draft GEIS comprehensively reviewed the environmental impacts of the Department's program for regulating the siting, drilling, production and plugging and abandonment of oil, gas, underground gas storage, solution mining, brine disposal, geothermal and stratigraphic test wells. The findings statement issued on the Draft and Final GEIS in September, 1992 neglected to specifically mention DEC's program for leasing of State lands for these resource development activities.

Prior to adoption of the GEIS, proposed lease sales underwent a segmented review. Segmented reviews are permitted under certain circumstances if they are no less protective of the environment. This is true given the highly speculative nature of oil and gas leasing practices:

- It is impractical to review the potential environmental impacts of development activities at the leasing stage. Information on the placement of well sites is not generally known, even by the lessee. Not until a company successfully obtains a lease does it invest time and money in preparing the exploration and development plans that will be submitted to the Department for approval if the lessee wishes to commence operations.

- Most of the land leased will never be directly affected by development activities. Based on a 15 year record of the State's leasing program, less than one percent of all the State land leased has been subject to any direct impact.

- When the lessee does decide on a proposed well site on a State lease, the lessee must obtain a site-specific drilling permit from the Department. With eve well drilling permit application the Department requires: 1) a program-specific Environmental Assessment Form, 2) a plat (map) showing the proposed well location and support facilities, and 3) a pre-drilling site inspection that allows the Department to :
  - reliably determine potential environmental problems; and

- select appropriate permit conditions for mitigating potential environmental impacts.

- Possession of a lease does not a priori grant the right to drill on a lease. Nor is the lessee in any way guaranteed approval for their first-choice drilling location. Clauses included in the lease inform the lessee that any surface disturbing activities must receive Department review and approval prior. to their commencement. Leases also contain clauses recommended by other State agency staff that are necessary for protection of fish, wildlife, plant, land, air, wetlands, water and cultural resources on the leased parcels.

SEOR Determination of Significance

The Department has determined that the act of leasing State lands for activities regulated under ECL Article 23 does not have a significant environmental impact. This determination is supported by the facts listed above.

SEOR Review Procedures

Department staff will no longer make Determinations of Significance and Negative or Positive Declarations under SEQR for leases on State lands for activities regulated under ECL Article 23 at the time that the lease is granted; SEQR reviews will continue to be done as needed for site-specific development.

CERTIFICATION OF SUPPLEMENTAL FINDINGS ON THE FINAL GENERIC ENVIRONMENTAL IMPACT STATEMENT ON THE OIL, GAS AND SOLUTION MINING REGULATORY PROGRAM

Having considered the Draft and Final GEIS, and having considered the preceding written facts and conclusions relied upon to meet the requirements of 6NYCRR Part 617.9, this Supplemental Statement of Findings certifies that:

1. The requirements of 6NYCRR Part 617 have been met.

2. Consistent with the social, economic, and other essential considerations from among the reasonable alternatives thereto, the action approved is one which minimizes or avoids adverse environmental effects to the maximum extent practicable; including the effects disclosed in the environmental impact statement.

3. Consistent with the social, economic, and other essential considerations, to the maximum extent practicable, adverse environmental effects revealed in the environmental impact statement process will be minimized or avoided by incorporating as conditions to the decision those mitigative measures which were identified as practicable.

4. Consistent with the applicable policies of Article 42 of the Executive Law, as implemented by 19 NYCRR 600.5, this action will achieve a balance between the protection of the environment and the need to accommodate social and economic considerations.

/S/ April 19, 1993

Gregory H. Sovas, Director
Division of Mineral Resources

New York State

DEC

Division of Mineral Resources

Appendix 4

Application Form for Permit to Drill, Deepen, Plug Back or Convert a Well Subject to the Oil, Gas and Solution Mining Regulatory Program

Draft Supplemental Generic Environmental Impact Statement

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF MINERAL RESOURCES • BUREAU OF OIL AND GAS REGULATION

PRINT OR TYPE IN BLACK INK

APPLICATION FOR PERMIT TO DRILL, DEEPEN, PLUG BACK OR CONVERT A WELL SUBJECT TO THE OIL, GAS AND SOLUTION MINING LAW

THIS APPLICATION IS A LEGAL DOCUMENT. READ THE APPLICABLE AFFIRMATION AND ACKNOWLEDGMENT CAREFULLY BEFORE SIGNING.

For instructions on completing this form, visit the Division's website at www.dec.ny.gov/energy/205.html or contact your local Regional office.

PLANNED OPERATION: (Check one)
☐ Drill ☐ Deepen ☐ Plug Back ☐ Convert

TYPE OF WELL: (Check one)
☐ New ☐ Existing

Existing API Well Identification Number
31- | | | - | | | | | - | | - | | |

TYPE OF WELL BORE: (Check one)
☐ Vertical ☐ Directional Sidetrack

NAME OF OWNER (Full Name of Organization or Individual as registered with the Division) | TELEPHONE NUMBER (include area code)

ADDRESS (P.O. Box or Street Address, City, State, Zip Code)

NAME AND TITLE OF LOCAL REPRESENTATIVE WHO CAN BE CONTACTED WHILE OPERATIONS ARE IN PROGRESS

ADDRESS–Business (P.O. Box or Street Address, City, State, Zip Code) | TELEPHONE NUMBER (include area code)

ADDRESS–Night, Weekend and Holiday (P.O. Box or Street Address, City, State, Zip Code) | TELEPHONE NUMBER (include area code)

WELL LOCATION DATA (attach plat)

COUNTY | TOWN | FIELD/POOL NAME (or "Wildcat")

WELL NAME | WELL NUMBER | NUMBER OF ACRES IN UNIT

7½ MINUTE QUAD NAME | QUAD SECTION | PROPOSED TARGET FORMATION

LOCATION DESCRIPTION			Decimal Latitude (NAD83)	Decimal Longitude (NAD83)
Surface	0'	0'	___ ___ . ___ ___ ___ ___ ___ ___	___ ___ . ___ ___ ___ ___ ___ ___
Top of Target Interval			___ ___ . ___ ___ ___ ___ ___ ___	___ ___ . ___ ___ ___ ___ ___ ___
Bottom of Target Interval			___ ___ . ___ ___ ___ ___ ___ ___	___ ___ . ___ ___ ___ ___ ___ ___
Bottom Hole	TVD	TMD	___ ___ . ___ ___ ___ ___ ___ ___	___ ___ . ___ ___ ___ ___ ___ ___

PROPOSED WELL DATA

WELL TYPE (check one)
☐ Oil Production ☐ Gas Production ☐ Brine ☐ Storage
☐ Injection ☐ Brine Disposal ☐ Geothermal ☐ Stratigraphic
☐ Other _____

PLANNED TOTAL DEPTH
TVD _____ ft.
TMD _____ ft.
Kickoff _____ TMD

PLANNED DATE OF COMMENCEMENT OF OPERATIONS

SURFACE ELEVATION (check how obtained)
_____ ft. ☐ Surveyed ☐ Topo Map ☐ Other _____

TYPE OF TOOLS
☐ Cable ☐ Rotary

PLANNED DRILLING FLUID
☐ Air ☐ Water ☐ Mud

NAME OF PLANNED DRILLING CONTRACTOR (as registered with the Division) | TELEPHONE NUMBER (include area code)

ON ATTACHED SHEET GIVE DETAILS FOR EACH PROPOSED CASING STRING AND CEMENT JOB INCLUDING BUT NOT LIMITED TO: Bit size, casing size, casing weight and grade, TVD and TMD of casing set, scratchers, centralizers, cement baskets, sacks of cement, class of cement, cement additives with percentages or pounds per sack, estimated TVD and TMD of the top of cement, estimated amount of excess cement and waiting-on-cement time.

FOR DIRECTIONAL OR SIDETRACK WELLS ALSO INCLUDE A WELL BORE DIAGRAM SHOWING THE LOCATION OF THE ITEMS INCLUDED IN THE ABOVE REFERENCED DETAILS.

DEPARTMENT USE ONLY

BOND NUMBER

API WELL IDENTIFICATION NUMBER
31-

RECEIPT NUMBER

DATE ISSUED

WELL NAME	WELL NUMBER	NAME OF OWNER

COMMENTS:

AFFIRMATION AND ACKNOWLEDGMENT

A. For use by individual:

By the act of signing this application:

(1) I affirm under penalty that the information provided in this application is true to the best of my knowledge and belief; and that I possess the right to access property, and drill and/or extract oil, gas, or salt, by deed or lease, from the lands and site described in the well location data section of this application. I am aware that any false statement made in this application is punishable as a Class A Misdemeanor under Section 210.45 of the Penal Law.

(2) I acknowledge that if the permit requested to be issued in consideration of the information and affirmations contained in this application is issued, as a condition to the issuance of that permit, I accept full legal responsibility for all damage, direct or indirect, of whatever nature and by whomever suffered, arising out of the activity conducted under authority of that permit; and agree to indemnify and hold harmless the State, its representatives, employees, agents, and assigns for all claims, suits, actions, damages, and costs of every name and description, arising out of or resulting from the permittee's undertaking of activities or operation and maintenance of the facility or facilities authorized by the permit in compliance or non-compliance with the terms and conditions of the permit.

_____
Printed or Typed Name of Individual

_____ _____
Signature of Individual Date

B. For use by organizations other than an individual:

By the act of signing this application:

(1) I affirm under penalty of perjury that I am _____ (title) of _____ (organization); that I am authorized by organization to make this application; that this application was prepared by me or under my supervision and direction; and that the aforenamed organization possesses the right to access property, and drill and/or extract oil, gas, or salt by deed or lease, from the lands and site described in the well location data section of this application. I am aware that any false statement made in this application is punishable as a Class A Misdemeanor under Section 210.45 of the Penal Law.

(2) _____ (organization); acknowledges that if the permit requested to be issued in consideration of the information and affirmations contained in this application is issued, as a condition to the issuance of that permit, it accepts full legal responsibility for all damage, direct or indirect, of whatever nature and by whomever suffered, arising out of the activity conducted under authority of that permit; and agrees to indemnify and hold harmless the State, its representatives, employees, agents, and assigns for all claims, from suits, actions, damages, and costs of every name and description, arising out of or resulting from the permittee's undertaking of activities or operation and maintenance of the facility or facilities authorized by the permit in compliance or non-compliance with the terms and conditions of the permit.

_____
Printed or Typed Name of Authorized Representative

_____ _____
Signature of Authorized Representative Date

New York State

DEC

Division of Mineral Resources

Appendix 5

Environmental Assessment Form For Well Permitting

Draft Supplemental Generic Environmental Impact Statement

85-16-5 (1/07)--10b

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF MINERAL RESOURCES

ENVIRONMENTAL ASSESSMENT FORM

Attachment to Drilling Permit Application

WELL NAME AND NUMBER

NAME OF APPLICANT | BUSINESS TELEPHONE NUMBER ( )

ADDRESS OF APPLICANT

CITY/P.O. | STATE | ZIP CODE

DESCRIPTION OF PROJECT (Briefly describe type of project or action)

PROJECT SITE IS THE WELL SITE AND SURROUNDING AREA WHICH WILL BE DISTURBED DURING CONSTRUCTION OF SITE, ACCESS ROAD, and PIT AND ACTIVITIES DURING DRILLING AND COMPLETION AT WELLHEAD.

(PLEASE COMPLETE EACH QUESTION--Indicate N.A., if not applicable)

LAND USE AND PROJECT SITE

1. Project Dimensions. Total Area of Project Site _____ sq. ft.
   Approximate square footage for items below:

	During Construction (sq. ft.)	After Construction (sq. ft.)
a. Access Road (length x width)		
b. Well Site (length x width)		

2. Characterize Project Site Vegetation and Estimate Percentage of Each Type Before Construction:

_____ % Agricultural (cropland, hayland, pasture, vineyard, etc.) _____ % Forested _____ % Wetlands

_____ % Meadow or Brushland (non agricultural) _____ % Non vegetated (rock, soil, fill)

3. Present Land Use(s) Within ¼ Mile of Project (Check all that apply)

☐ Rural ☐ Suburban ☐ Forest ☐ Urban ☐ Agricultural ☐ Commercial ☐ Park/Recreation
☐ Industrial ☐ Other _____

4. How close is the nearest residence, building, or outdoor facility of any type routinely occupied by people at least part of the day? _____ ft.
   Describe _____

ENVIRONMENTAL RESOURCES ON/NEAR PROJECT SITE

5. The presence of certain environmental resources on or near the project site may require additional permits, approvals or mitigation measures--Is any part of the well site or access road located:

a. Over a primary or principal aquifer?	☐ Yes	☐ No	☐ Not Known
b. Within 2,640 feet of a public water supply well?	☐ Yes	☐ No	☐ Not Known
c. Within 150 feet of a surface municipal water supply?	☐ Yes	☐ No	☐ Not Known
d. Within 150 feet of a lake, stream, or other public surface water body?	☐ Yes	☐ No	☐ Not Known
e. Within an Agricultural District?	☐ Yes	☐ No	☐ Not Known
f. Within a land parcel having a Soil and Water Conservation Plan?	☐ Yes	☐ No	☐ Not Known
g. In a 100 year flood plain?	☐ Yes	☐ No	☐ Not Known
h. In a regulated wetland or its 100 foot buffer zone?	☐ Yes	☐ No	☐ Not Known
i. In a coastal zone management area?	☐ Yes	☐ No	☐ Not Known
j. In a Critical Environmental Area?	☐ Yes	☐ No	☐ Not Known
k. Does the project site contain any species of animal life that are listed as threatened or endangered?	☐ Yes	☐ No	☐ Not Known
If yes, identify the species and source of information _____			
l. Will proposed project significantly impact visual resources of statewide significance?	☐ Yes	☐ No	☐ Not Known
If yes, identify the visual resource and source of information _____			

CULTURAL RESOURCES

6. Are there any known archeological and/or historical resources which will be affected by drilling operations? ☐ Yes ☐ No ☐ Not Known

7. Has the land within the project area been previously disturbed or altered (excavated, landscaped, filled, utilities installed)? ☐ Yes ☐ No ☐ Not Known

If answer to Number 6 or 7 is yes, briefly descrbe _____

EROSION AND RECLAMATION PLANS

8. Indicate percentage of project site within: 0-10% slope _____ % 10-15% slope _____ % greater than 15% slope _____ %

9. Are erosion control measures needed during construction of the access road and well site? ☐ Yes ☐ No ☐ Not Known

If yes, describe and/or sketch on attached photocopy of plat _____

10. Will the topsoil which is disturbed be stockpiled for reclamation use? ☐ Yes ☐ No

11. Does the reclamation plan include revegetation? ☐ Yes ☐ No

If yes, what plant materials will be used? _____

12. Does the reclamation plan include restoration or installation of surface or subsurface drainage features to prevent erosion or conform to a Soil and Water Conservation Plan? ☐ Yes ☐ No

If yes, describe _____

ACCESS ROAD SITING AND CONSTRUCTION

13. Are you going to use existing or common corridors when building the access road? Locate access road on attached photocopy of plat. ☐ Yes ☐ No

DRILLING

14. Anticipated length of drilling operations? _____ days.

WASTE STORAGE AND DISPOSAL

15. How will drilling fluids and stimulation fluids:

a. Be contained? _____

b. Be disposed of? _____

16. Will production brine be stored on site? ☐ Yes ☐ No

If yes:
How will it be stored? _____

How will it be disposed of? _____

17. Will the drill cuttings and pit liner be disposed of on site? ☐ Yes ☐ No

If yes, expected burial depth? _____ feet

ADDITIONAL PERMITS

18. Are any additional State, Local or Federal permits or approvals required for this project? ☐ Yes ☐ No

	Date Application Submitted	Date Application Received
Stream Disturbance Permit (DEC)		
Wetlands Permit (DEC or Local)		
Floodplain Permit (DEC or Local)		
Other _____		

PREPARER'S SIGNATURE | DATE

NAME/TITLE (Please print)

REPRESENTING

Suggested Sources of Information for Division of Mineral Resources Environmental Assessment Form

3. LAND USE
   Sources: Local Planning Office
   Town Supervisor's Office
   Town Clerk's Office

5a. PRIMARY OR PRINCIPAL AQUIFER
   Sources: Local unit of government
   NYS Department of Health
   NYSDEC, Division of Water--Regional Office
   Availability of Water from Aquifers in New York State--United States Geological Survey
   Availability of Water from Unconsolidated Deposits in Upstate New York--United States Geological Survey

5b. PUBLIC WATER SUPPLY
   Sources: Local unit of government
   NYS Department of Health
   NYS Atlas of Community Water Systems Sources, NYS Department of Health, 1982
   Atlas of Eleven Selected Aquifers in New York State, United States Geological Survey, 1982

5c. AGRICULTURAL DISTRICT INFORMATION
   Sources: Cooperative Extension
   DEC, Division of Lands and Forests
   NYS Department of Agriculture and Markets
   DEC, Division of Environmental Permits--Regional Office
   DEC, Division of Mineral Resources--Regional Office

5f. SOIL AND WATER CONSERVATION PLAN
   Sources: Landowner
   County Soil and Water Conservation District Office

5g. 100 YEAR FLOOD PLAIN
   Sources: DEC Division of Water
   DEC, Division of Environmental Permits--Regional Office
   DEC, Division of Mineral Resources--Regional Office

5h. WETLANDS
   Sources: DEC, Division of Fish and Wildlife--Regional Office
   DEC, Division of Mineral Resources--Regional Office

5i. COASTAL ZONE MANAGEMENT AREAS
   Sources: Local unit of government
   NYS Department of State, Coastal Management Program
   DEC, Division of Water (maps)
   DEC, Division of Environmental Permits--Regional Office

5k. THREATENED OR ENDANGERED SPECIES
   Sources: DEC, Natural Heritage Program--Albany
   DEC, Division of Environmental Permits--Regional Office

6. ARCHEOLOGICAL OR HISTORIC RESOURCES
   Sources: NYS Office of Parks, Recreation and Historic Preservation circles and squares map
   DEC, Division of Environmental Permits--Regional Office

18. ADDITIONAL PERMITS NEEDED
   Sources: DEC, Division of Environmental Permits--Regional Office
   DEC, Division of Mineral Resources--Regional Office
   NYS Office of Business Permits

New York State

DEC

Division of Mineral Resources

Appendix 6

PROPOSED
Environmental Assessment Form
(EAF) Addendum

Draft Supplemental Generic Environmental Impact Statement

REQUIRED INFORMATION

- Minimum depth and elevation of top of fracture zone for entire length of wellbore
- Estimated maximum depth and elevation of bottom of potential fresh water, and basis for estimate (water well information, other well information, previous drilling at pad, published or private reports, etc.)
- Identification of proposed fracturing service company and additive products
- Proposed volume of fracturing fluid and % by weight of water, proppants and each additive
- Water source for hydraulic fracturing
    - If a newly proposed surface water source (not previously approved by DEC as part of a well permit application):
        - Location of water withdrawal point, status of RBC approval if applicable
        - Indicate if an Article 15 permit is required and status
        - Size of drainage area above withdrawal point (in mi^2)
        - Indicate whether there is a USGS gauge on the stream; if yes:
            - Distance to stream gauge
            - Upstream or downstream of stream gauge
            - Changes in stream flow (e.g., other withdrawals, diversions, tributary input) between gauge and withdrawal point
            - Years of stream gauge data available and period of record
    - If a previously proposed or DEC-approved surface water source:
        - API # of well permit application associated with previous proposal or approval
- Distance from surface location of well to:
    - Any known water well or domestic-supply spring within 2,640 feet, including public or private wells, community or non-community systems
- Distance from closest edge of well pad to:
    - Any water supply reservoir within 1,320 feet (include reservoir stem and controlled lake in NYC Watershed)
    - Any perennial or intermittent stream, wetland, storm drain, lake or pond within 660 feet (include watercourse in NYC Watershed)
    - All occupied structures or places of assembly within 1,320 feet
- Capacity of rig fuel tank(s) and distance to:
    - Any primary or principal aquifer, public or private water well, domestic-supply spring, reservoir, perennial or intermittent stream, storm drain, wetland, lake or pond within 500 feet of the planned tank location (include reservoir stem, controlled lake and watercourse in NYC Watershed).
- Available information about water wells and domestic-supply springs within 2,640 feet
    - Well name and location
    - Distance from proposed surface location of well
    - Shortest distance from proposed well pad
    - Shortest distance from proposed centralized flowback water impoundment
    - Well depth
    - Well's completed interval
    - Public or private supply

  - Community or non-community system (see DOH definitions)
  - Type of facility or establishment if not a residence
- Information about the planned construction and capacity of the reserve pit
- Information about the number and individual and total capacity of receiving tanks for flowback water
- Stack heights for: drilling rig and hydraulic fracturing engines, flowback vent/flare, glycol dehydrator. If proposed flowback vent/flare stack height is less than 30 feet, then documentation that previous drilling at the pad did not encounter H_2S is required.
- Description of planned public access restrictions, including physical barriers and distance to edge of well pad
- Description of other control measures planned to reduce particulate matter emissions during the hydraulic fracturing process

REQUIRED ATTACHMENTS

- Topographic map of area within at least 2,640 feet of surface location showing:
  - above features and scaled distances
  - location and orientation of well pad
  - well pad close-up showing placement of fuel tank, reserve pit and receiving tanks for flowback water
  - location of access road
  - location of any flowback water pipelines or conveyances
  - location of any centralized flowback water impoundment proposed for use
- Evidence of diligent efforts by the well operator to determine the existence of public or private water wells and domestic-supply springs within half a mile (2,640 feet) of any proposed drilling location or centralized flowback water impoundment if proposed.
  - List of municipal officials contacted for water well information and printed copies of responses
  - List of property owners and tenants contacted for water well information
  - List of adjacent lessees contacted for water well information
  - Printed results of EPA SDWIS search (http://oaspub.epa.gov/enviro/sdw_form_v2.create_page?state_abbr=NY)
  - Printed results of DEC Water Well search (http://www.dec.ny.gov/cfmx/extapps/WaterWell/index.cfm?view=searchByCounty)
- For a newly proposed surface water withdrawal:
  - Map of drainage area above the withdrawal point.
  - If stream gauge data is available: monthly tabulation for January through December of 30% of average daily flow and 30% of average monthly flow, with calculations and assumptions for calculations.
- Invasive species survey and map
- Proposed fluid disposal plan, pursuant to 6 NYCRR 554.1(c)(1)
  - Planned transport of flowback water off of well pad – trucking or piping
    - If piping, describe construction including size, materials, leak prevention and spill control measures

- Planned disposition of flowback water – treatment facility, disposal well, reuse on same well pad, reuse on another well pad, centralized flowback surface water impoundment, centralized tank facility, or other (describe)
  - If a treatment facility in NY:
    - Name, owner/operator, location
    - SPDES permit # and date if applicable
    - If a POTW, date of NYSDEC approval to receive flowback water (attach a copy of approval notification)
    - Brief description of facility and treatment if not a POTW
  - If a disposal well in NY:
    - SPDES permit # and date
    - EPA UIC permit # and date
  - If a newly proposed centralized flowback water surface impoundment in New York:
    - Location, affirmation of ownership or permission,
    - Distance from edge of impoundment to:
      - any water supply reservoir within 1,320 feet and
      - any perennial or intermittent stream, wetland, storm drain, lake or pond within 660 feet
    - Design information necessary to determine applicability of dam safety construction and operational requirements
    - Double liner system specifications – material, thickness, specify clay or GCL for lower composite liner
    - Description of leak detection and groundwater monitoring systems
    - Closure plan
    - Construction as required by Subpart 360-6
    - If available, flowback water analyses for the same specific additive mix (i.e., components and concentrations) used in the same formation within reasonable proximity to the wellbore
    - In the absence of representative flowback water analyses:
      - complete compositional information for any additive not listed on Table 5.3 of the SGEIS
    - Description of planned public access restrictions, including physical barriers and distance to edge of impoundment
    - Other proposed control measures for preventing public exposure to hazardous air pollutants in excess of guidance thresholds (e.g., duration and use limitations, cover, etc.)
  - If a previously proposed or approved centralized flowback water surface impoundment in New York:
    - API # for well permit application associated with previous proposal or approval
  - If a centralized tank facility in New York:
    - Location, affirmation of ownership or permission
    - Certification of compliance with 360-6.3

REQUIRED AFFIRMATIONS

- Any surface water withdrawal associated with this well pad will only occur when flow is above the appropriate threshold as established by NYSDEC –DFWMR (larger of 30%ADF and 30%AMF *or* 0.5/1.0/4.0 cfs/mi^2 per SGEIS Table 7.2)
- Applicable FIRM and Flood Boundary and Floodway maps consulted, and proposed well pad and access road are/are not within a mapped100-year floodplain.
- Any existing comprehensive, open space and/or agricultural plan or similar policy document(s) identified and reviewed by the applicant.
- Baseline residential well sampling, analysis and ongoing monitoring will be conducted and results shared with property owner and county health department as described in SGEIS and permit conditions.
- Unless otherwise required by private lease agreement, the access road will be located as far as practical from occupied structures, places of assembly and unleased property.
- MSGP authorization for stormwater discharges will be obtained prior to site disturbance.
- Use of ultra-low sulfur fuel (< 15 ppm)
- Operator will prepare and adhere to the following site plans, which will be available to the Department upon request and available on-site to Department inspector while activities addressed by the plan are occurring:
    - a visual impacts mitigation plan consistent with the SGEIS;
    - a noise impacts mitigation plan consistent with the SGEIS;
    - a greenhouse gas impacts mitigation plan consistent with the SGEIS; and
    - an invasive species mitigation plan which includes:
        - the best management practices listed in the SGEIS and
        - seasonally appropriate site-specific and species-specific physical and chemical control methods (e.g., digging to remove all roots, cutting to the ground, applying herbicides to specific plant parts such as stems or foliage, etc.) based on the invasive species survey submitted with the EAF Addendum.
- Operator will adhere to all well permit conditions, including requirement for Department approval prior to making any change.

ADDITIONAL SUBMISSIONS REQUIRED PRIOR TO SITE DISTURBANCE

- Road use agreement with local governing authority OR trucking plan and documentation of efforts to obtain a road use agreement
- Local floodplain development permit, if required

New York State

DEC

Division of Mineral Resources

Appendix 7

Sample Drilling Rig Specifications

Provided by Chesapeake Energy

Draft Supplemental Generic Environmental Impact Statement

ATTACHMENT A
RIG SPECIFICATIONS
Example #1

National Cabot 900
Working Depth: 12,000'

DRAWWORKS:	National Model 2346 – Mechanical – Grooved for 1 1/8'' drilling line. Air operated, water cooled Eaton Assist Brake
ENGINES:	2 - Cat C-15 (475HP ea.) with Allison Transmissions
MAST:	NOV - 117' - 350,000 SHL on 8 lines
SUBSTRUCTURE:	NOV - 18' Floor Height /15' Working Height
TRAVELING EQUIPMENT:	IDECO UTB – 265 Ton Block and Hook
ROTARY TABLE:	27 ½'' with 440,000# capacity
TUBULARS:	12,000' - S-135 - 4 1/2''x 16.60# per foot w/ XH connections 18 - 6 ½'' collars with NC46 connections
MUD PUMPS:	2 – National 9-P-100 with Cat 3508 Mechanicals (935HP ea.)
MUD SYSTEM:	3 - Tank, 900 BBL total
SOLIDS CONTROL EQUIPMENT:	Shakers: 2 – NOV D285P-LP Desander: Brandt - 2 - 10" Cones Desilter: Brandt - 12 - 4" Cones Agitators: 6 – Brandt with 36'' Impellers
BOP EQUIPMENT:	1 - Shaffer LXT - 11" 5M - Double Ram 1 – Shaffer Spherical - 11" 5M - Annular
CLOSING UNIT:	Koomey - 6 Station - 160 Gallon; 3000 psi
CHOKE MANIFOLD:	3'' x 4'' - 5M, 1 Hydraulic Choke and 1 Manual Choke
GENERATORS:	2 - Caterpillar 545 kW, Powered by 2 Cat C-18's
AUXILARY EQUIPMENT:	Water Tank: 400 BBL Fuel Tank: 10,000 Gallons
SPECIAL TOOLS:	2 - Braden PD12C Hydraulic Hoist Hydraulic Pipe Spinner Oil Works OWI-1000 Wire line with 12,000' of wire

Rig Specifications
Example #2

---

610 Mechanical 750 HP
Working Depth: 14,000'

DRAWWORKS: National 610 Mechanical
Wichita 325 Air Brake

ENGINES: 2 – Caterpillar C-18's, 600 HP Each

MAST: Dreco 142' 550,000 SHL on 10 Lines

SUBSTRUCTURE: Dreco 20' Box on Box

TRAVELING EQUIPMENT: Block-Hook: Ideco UTB-265-5-36

ROTARY TABLE: National C-275

COMPOUND: National 2 Engines

TORQUE CONVERTERS: 2 – National C195

MUD PUMPS: 2 – National 9-P-100, Independent Drive Cummins QSK38, 920 HP

MUD SYSTEM: 2 – Tank, 750 BBL total w/100 BBL Premix

SOLIDS CONTROL EQUIPMENT:
Shakers: 2 – National Model DLMS-285P
Desander: National with 2 - 10" Cones
Desilter: National with 16 - 4" Cones

BOP EQUIPMENT: 1 – Shaffer LWS Type 11" 5M
1 – Shaffer Spherical Type 11: 5M

CLOSING UNIT: Koomey 6 Station 180 Gallon; 1 Air and 1 Electrical Pump

CHOKE MANIFOLD: 4'' x 3'' 5M, 2 Adjustable Chokes

GENERATORS: 2 – Cat 545 kW, Powered by 2 Cat C-18's

AUXILARY EQUIPMENT:
Water Tank: 500 BBL
Fuel Tank: 12,000 Gallons

SPECIAL TOOLS:
ST-80 Iron Roughneck
Pipe Spinner: Hydraulic
Auto Driller: Satellite
Totco EDR (Rental)
Separator/Trip Tank Combo (Rental)
Hoists: 1 – Thern 2.5A Air Hoist
1 - Braden PD12C Hydraulic Hoist

Rig Specifications
Example #3

SpeedStar 185K -- 515 HP
Working Depth: 8,000'

ENGINE: 1 – Caterpillar C-15 with Allison Transmission

MAST: SpeedStar – 61' – 185,000 LB SHL
Setback Capacity of 7,000' – 3.5" Drill Pipe

SUBSTRUCTURE: Box Type – 7'6" Working Height

MUD PUMP: 1 – MP5

MUD SYSTEM: 2 – Tank, 600 BBL

BOP EQUIPMENT: 11" x 3M Annular

CLOSING UNIT: Townsend 4 Station, 80 Gallon

CHOKE MANIFOLD: 3'' x 3'' 5K with 1 Hydraulic Choke

GENERATORS: 2 – Onan 320 kW with Cummins Engines

DRILL PIPE: 7,500' OF 3.5" 13.30 LB/FT with IF Connections

DRILL COLLARS: 12 – 6 ½"

AIR SYSTEM: 3 – Ingersoll Rand 1170/350 Air Compressors
2 – Single Stage Boosters

AUXILARY EQUIPMENT: Water Tank: 250 BBL
Fuel Tank: 3,500 Gallons

SPECIAL TOOLS: 2 – Braden PD12C Hydraulic Tub Winches
Myers 35GPM Soap Pump
Martin Decker Geolograph
Wireline Unit with 10,000' of Line

New York State

DEC

Division of Mineral Resources

Appendix 8

Casing & Cementing Practices Required for All Wells in NY

Draft Supplemental Generic Environmental Impact Statement

New York State Department of Environmental Conservation
Casing and Cementing Practices

SURFACE CASING

1. The diameter of the drilled surface casing hole shall be large enough to allow the running of centralizers in recommended hole sizes.

RECOMMENDED CENTRALIZER-HOLE SIZE COMBINATIONS

Centralizer Size Inches	Minimum Hole Sizes Inches	Minimum Clearance Inches
4-1/2	6-1/8	1-5/8
5-1/2	7-3/8	1-7/8
6-5/8	8-1/2	1-7/8
7	8-3/4	1-3/4
8-5/8	10-5/8	2
9-5/8	12-1/4	2-5/8
13-3/8	17-1/2	4-1/8

NOTE: (1) If a manufacturer's specifications call for a larger hole size than indicated in the above table, then the manufacturer's specs take precedence.

(2) Check with the appropriate regional office for sizes not listed above.

2. Surface casing shall extend at least 75 feet beyond the deepest fresh water zone encountered or 75 feet into competent rock (bedrock), whichever is deeper, unless otherwise approved by the Department. However, the surface pipe must be set deeply enough to allow the BOP stack to contain any formation pressures that may be encountered before the next casing is run.

3. Surface casing shall not extend into zones known to contain measurable quantities of shallow gas. In the event that such a zone is encountered before the fresh water is cased off, the operator shall notify the Department and, with the Department's approval, take whatever actions are necessary to protect the fresh water zone(s).

4. All surface casing shall be a string of new pipe with a mill test of at least 1,100 pounds per square inch (psi), unless otherwise approved. Used casing may be approved for use, but must be pressure tested before drilling out the casing shoe or, if there is no casing shoe, before drilling out the cement in the bottom joint of casing. If plain end pipe is welded together for use, it too must be pressure tested. The minimum pressure for testing used casing or casing joined together by welding, shall be determined by the Department at the time of permit application. The appropriate Regional Mineral Resources office staff will be notified six hours prior to making the test. The results will be entered on the drilling log.

5. Centralizers shall be spaced at least one per every 120 feet; a minimum of two centralizers shall be run on surface casing. Cement baskets shall be installed appropriately above major lost circulation zones.

6. Prior to cementing any casing strings, all gas flows shall be killed and the operator shall attempt to establish circulation by pumping the calculated volume necessary to circulate. If the hole is dry, the calculated volume would include the pipe volume and 125% of the annular volume. Circulation is deemed to have been established once fluid reaches the surface. A flush, spacer or extra cement shall be used to separate the cement from the bore hole spacer or extra cement shall be used to separate the cement from the bore hole fluids to prevent dilution. If cement returns are not present at the surface, the operator may be required to run a log to determine the top of the cement.

7. The pump and plug method shall be used to cement surface casing, unless approved otherwise by the Department. The amount of cement will be determined on a site-specific basis and a minimum of 25% excess cement shall be used, with appropriate lost circulation materials, unless other amounts of excesses are approved or specified by the Department.

8. The operator shall test or require the cementing contractor to test the mixing water for pH and temperature prior to mixing the cement and to record the results on the cementing ticket.

9. The cement slurry shall be prepared according to the manufacturer's or contractor's specifications to minimize free water content in the cement.

10. After the cement is placed and the cementing equipment is disconnected, the operator shall wait until the cement achieves a calculated compressive strength of 500 psi before the casing is disturbed in any way. The waiting-on-cement (WOC) time shall be recorded on the drilling log.

11. When drive pipe (conductor casing) is left in the ground, a pad of cement shall be placed around the well bore to block the downward migration of surface pollutants. The pad shall be three feet square or, if circular, three feet in diameter and shall be crowned up to the drive pipe (conductor casing), unless otherwise approved by the Department.

WHEN REQUESTED BY THE DEPARTMENT IN WRITING, EACH OPERATOR MUST SUBMIT CEMENT TICKETS AND/OR OTHER DOCUMENTS THAT INDICATE THE ABOVE SPECIFICATIONS HAVE BEEN FOLLOWED.

THE CASING AND CEMENTING PRACTICES ABOVE ARE DESIGNED FOR TYPICAL SURFACE CASING CEMENTING. THE DEPARTMENT WILL REQUIRE ADDITIONAL MEASURES FOR WELLS DRILLED IN ENVIRONMENTALLY OR TECHNICALLY SENSITIVE AREAS (i.e., PRIMARY OR PRINCIPAL AQUIFERS).

THE DEPARTMENT RECOGNIZES THAT VARIATIONS TO THE ABOVE PROCEDURES MAY BE INDICATED IN SITE SPECIFIC INSTANCES. SUCH VARIATIONS WILL REQUIRE THE PRIOR APPROVAL OF THE REGIONAL MINERAL RESOURCES OFFICE STAFF.

INTERMEDIATE CASING

Intermediate casing string(s) and the cementing requirements for that casing string(s) will be reviewed and approved by Regional Mineral Resources office staff on an individual well basis.

PRODUCTION CASING

12. The production casing cement shall extend at least 500 feet above the casing shoe or tie into the previous casing string, whichever is less. If any oil or gas shows are encountered or known to be present in the area, as determined by the Department at the time of permit application, or subsequently encountered during drilling, the production casing cement shall extend at least 100 feet above any such shows. The Department may allow the use of a weighted fluid in the annulus to prevent gas migration in specific instances when the weight of the cement column could be a problem.

13. Centralizers shall be placed at the base and at the top of the production interval if casing is run and extends through that interval, with one additional centralizer every 300 feet of the cemented interval. A minimum of 25% excess cement shall be used. When caliper logs are run, a 10% excess will suffice. Additional excesses may be required by the Department in certain areas.

14. The pump and plug method shall be used for all production casing cement jobs deeper than 1500 feet. If the pump and plug technique is not used (less than 1500 feet), the operator shall not displace the cement closer than 35 feet above the bottom of the casing. If plugs are used, the plug catcher shall be placed at the top of the

lowest (deepest) full joint of casing.

15. The casing shall be of sufficient strength to contain any expected formation or stimulation pressures.

16. Following cementing and removal of cementing equipment, the operator shall wait until a compressive strength of 500 psi is achieved before the casing is disturbed in any way. The operator shall test or require the cementing contractor to test the mixing water for pH and temperature prior to mixing the cement and to record the results on the cementing tickets and/or the drilling log. WOC time shall be adjusted based on the results of the test.

17. The annular space between the surface casing and the production string shall be vented at all times. If the annular gas is to be produced, a pressure relief valve shall be installed in an appropriate manner and set at a pressure approved by the Regional Mineral Resources office.

WHEN REQUESTED BY THE DEPARTMENT IN WRITING, EACH OPERATOR MUST SUBMIT CEMENT TICKETS AND/OR OTHER DOCUMENTS THAT INDICATE THE ABOVE SPECIFICATIONS HAVE BEEN FOLLOWED.

THE CASING AND CEMENTING PRACTICES ABOVE ARE DESIGNED FOR TYPICAL PRODUCTION CASING/ CEMENTING. THE DEPARTMENT WILL REQUIRE ADDITIONAL MEASURES FOR WELLS DRILLED IN ENVIRONMENTALLY OR TECHNICALLY SENSITIVE AREAS (i.e., PRIMARY OR PRINCIPAL AQUIFERS).

THE DEPARTMENT RECOGNIZES THAT VARIATIONS TO THE ABOVE PROCEDURES MAY BE INDICATED IN SITE SPECIFIC INSTANCES. SUCH VARIATIONS WILL REQUIRE THE PRIOR APPROVAL OF THE REGIONAL MINERAL RESOURCES OFFICE.

New York State

DEC

Division of Mineral Resources

Appendix 9

Fresh Water Aquifer Supplementary Permit Conditions Required for All Wells in Primary and Principal Aquifers

Draft Supplemental Generic Environmental Impact Statement

FRESH WATER AQUIFER SUPPLEMENTARY PERMIT CONDITIONS

Operator: Well Name:
API Number:

1. All pits must be lined and sized to fully contain all drilling, cementing and stimulation fluids plus any fluids as a result of natural precipitation. Use of these pits for any other purpose is prohibited.

2. All fluids must be contained on the site and properly disposed. If operations are suspended and the site is left unattended at any time, pit fluids must be removed from the site immediately. After the cessation of drilling and/or stimulation operations, pit fluids must be removed within 7 days. Disposal of fluids must be undertaken by a waste transporter with an approved 6 NYCRR Part 364 permit.

3. Any hole drilled for conductor or surface casing (i.e., "water string") must be drilled on air, fresh water, or fresh water mud. For any holes drilled with mud, techniques for removal of filter cake (e.g., spacers, additional cement, appropriate flow regimes) must be considered when designing any primary cement job on conductor and surface casing.

4. If conductor pipe is used, it must be run in a drilled hole and it must be cemented back to surface by circulation down the inside of the pipe and up the annulus, or installed by another procedure approved by this office. Lost circulation materials must be added to the cement to ensure satisfactory results. Additionally, at least two centralizers must be run with one each at the shoe and at the middle of the string. In the event that cement circulation is not achieved, cement must be grouted (or squeezed) down from the surface to ensure a complete cement bond. In lieu of or in combination with such grouting or squeezing from the surface, this office may require perforation of the conductor casing and squeeze cementing of perforations. This office must be notified _____ hours prior to cementing operations and cementing cannot commence until a state inspector is present.

5. A surface casing string must be set at least 100' below the deepest fresh water zone and at least 100' into bedrock. If shallow gas is known to exist or is anticipated in this bedrock interval, the casing setting depth may be adjusted based on site-specific conditions provided it is approved by this office. There must be at least a 2½" difference between the diameters of the hole and the casing (excluding couplings) or the clearance specified in the Department's Casing and Cementing Practices, whichever is greater. Cement must be circulated back to the surface with a minimum calculated 50% excess. Lost circulation materials must be added to the cement to ensure satisfactory results. Additionally, cement baskets and centralizers must be run at appropriate intervals with centralizers run at least every 120'. Pipe must be either new API graded pipe with a minimum internal yield pressure of 1,800 psi or reconditioned pipe that has been tested internally to a minimum of 2,700 psi. If reconditioned pipe is used, an affidavit that the pipe has been tested must be submitted to this office before the pipe is run. This office must be notified _____ hours prior to cementing operations and cementing cannot commence until a state inspector is present.

6. If multiple fresh water zones are known to exist or are found or if shallow gas is present, this office may require multiple strings of surface casing to prevent gas intrusion and/or preserve the hydraulic characteristics and water quality of each fresh water zone. The permittee must immediately inform this office of the occurrence of any fresh water or shallow gas zones not noted on the permittee's drilling application and prognosis. This office may require changes to the casing and cementing plan in response to unexpected occurrences of fresh water or shallow gas, and may also require the immediate, temporary cessation of operations while such alterations are developed by the permittee and evaluated by the Department for approval.

7. In the event that cement circulation is not achieved on any surface casing cement job, cement must be grouted (or squeezed) down from the surface to ensure a complete cement bond. This office must be notified _____ hours prior to cementing operations and cementing cannot commence until a state inspector is present. In lieu of or in combination with such grouting or squeezing from the surface, this office may require perforation of the surface casing and squeeze cementing of perforations. This office may also require that a cement bond log and/or other logs be run for evaluation purposes. In addition, drilling out of and below surface casing cannot commence if there is any evidence or indication of flow behind the surface casing until remedial action has occurred. Alternative remedial actions from those described above may be approved by this office on a case-by-case basis provided site-specific conditions form the basis for such proposals.

8. This office must be notified _____ hours prior to any stimulation operation. Stimulation may commence without the state inspector if the inspector is not on location at the time specified during the notification.

9. The operator must complete the "Record of Formations Penetrated" on the Well Drilling and Completion Report providing a log of formations, both unconsolidated and consolidated, and all water and gas producing zones.

10. If the well is a producer, holding tanks with water-tight diking capable of retaining 1½ times the capacity of the tank must be installed for the containment of oil, brine and other production fluids. Disposal of fluids must only be undertaken by a waste transporter with an approved 6 NYCRR Part 364 permit.

11. **Any deviation from the above conditions must be approved by the Department prior to making a change.**

New York State

DEC

Division of Mineral Resources

Appendix 10

PROPOSED
Supplementary Permit Conditions
For High-Volume Hydraulic Fracturing

Draft Supplemental Generic Environmental Impact Statement

PROPOSED Supplementary Permit Conditions for High-Volume Hydraulic Fracturing

Planning and Local Coordination

1) All operations authorized by this permit must be conducted in accordance with the following site-specific plans prepared by the operator, available to the Department upon request, and available on-site to a Department inspector while activities addressed by the plan are taking place:
   a) a visual impacts mitigation plan consistent with the SGEIS,
   b) a noise impacts mitigation plan consistent with the SGEIS,
   c) a greenhouse gas emissions impacts mitigation plan consistent with the SGEIS, and
   d) an invasive species mitigation plan which includes:
      i) the best management practices listed in the SGEIS and
      ii) seasonally appropriate site-specific and species-specific physical and chemical control methods (e.g., digging to remove all roots, cutting to the ground, applying herbicides to specific plant parts such as stems or foliage, etc.) based on the invasive species survey submitted with the EAF Addendum.

2) The county emergency management office (EMO) must be notified of the well's location and the potential hazards involved as follows:
   a) prior to spudding the well,
   b) during any flaring while drilling,
   c) prior to high-volume hydraulic fracturing, and
   d) prior to flaring for well clean-up, treatment or testing.

   A record of the type, date and time of any notification provided to the EMO must be maintained by the operator and made available to the Department upon request. In counties without an EMO, the local fire department must be notified as described above.

3) Issuance of this permit does not provide relief from any local requirements authorized by or enacted pursuant to the New York State Vehicle and Traffic Law. Prior to site disturbance, the operator shall submit to the Department, for informational purposes only, a copy of any road use agreement between the operator and municipality. If no road use agreement has been reached, the operator shall file its trucking plan with the Department, for informational purposes only, along with documentation of its efforts to reach a road use agreement.

4) A copy of any required local floodplain development permit must be provided to the Department prior to any site disturbance.

5) Prior to site disturbance (for a new well pad) or spud (for an existing pad), the well operator must sample and test residential water wells within 1,000 feet of the well pad as described by the SGEIS, and provide results to the property owner and the county health department. If no wells are available for sampling within 1,000 feet, either because there are none of record or because the property owner denies permission, then wells within 2,000 feet must be sampled and tested with the property owner's permission.

6) Ongoing water well monitoring and testing must continue as described by the SGEIS until one year after hydraulic fracturing at the last well on the pad. More frequent or additional monitoring and testing may be required by the Department in response to complaints.

7) Water well analysis must be by an ELAP-certified laboratory. Analyses and documentation that all test results were provided to the property owner and the county health department must be maintained by the operator and made available to the Department upon request.

Site Preparation

8) Unless otherwise required by private lease agreement, the access road must be located as far as practical from occupied structures, places of assembly and unleased property.

9) Unless otherwise approved or directed by the Department, all of the topsoil in the project area stripped to facilitate the construction of well pads and access roads must be stockpiled and remain on site for use in final reclamation.

10) Authorization under the Department's Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activity (GP-0-06-002) (MSGP) must be obtained prior to any disturbance at the site.

11) Piping and conveyance used for flowback water must be constructed of materials compatible with flowback water composition and in accordance with the fluid disposal plan approved by the Department pursuant to 6 NYCRR 554.1(c)(1).

12) Any reserve pit, drilling pit or mud pit on the well pad which will be used for more than one well must be constructed as follows:

    a) Surface water and stormwater runoff must be diverted away from the pit,

    b) Pit volume may not exceed 250,000 gallons, or 500,000 gallons for multiple pits on one tract or related tracts of land,

    c) Pit sidewalls and bottoms must adequately cushioned and free of objects capable of puncturing and ripping the liner,

    d) Pits constructed in unconsolidated sediments must have beveled walls (45 degrees or less),

    e) The pit liner must be sized and placed with sufficient slack to accommodate stretching,

    f) Liner thickness must be at least 30 mils, and

    g) Seams must be factory installed or field seamed in accordance with the manufacturer's recommendations.

Site Maintenance

13) For multi-well pads:

a) Secondary containment consistent with the Department's Spill Prevention Operations Technology Series 10, Secondary Containment Systems for Aboveground Storage Tanks, (SPOTS 10) is required for all fuel tanks larger than 10,000 gallons,

b) To the extent practical, fuel tanks will not be placed within 500 feet of a public or private water well, a domestic-supply spring, a reservoir, a perennial or intermittent stream, a storm drain, a wetland, a lake or a pond,

c) To the extent practical, fuel tanks at locations within the NYC Watershed boundary shall not be placed within 500 feet of a reservoir, a reservoir stem, a controlled lake or a watercourse, as those terms are defined by the New York City Watershed Rules and Regulations,

d) Secondary containment consistent with the Department's SPOTS 10 is required for fuel tanks smaller than 10,000 gallons if the tanks are located within the boundaries of primary or principal aquifers or within 500 feet of the water resources listed in items b and c above,

e) Tank filling operations must be manned at the fueling truck and at the tank if the tank is not visible to the fueling operator from the truck, and

f) Troughs, drip pads or drip pans are required beneath the fill port of a fuel tank during filling operations if the fill port is not within the secondary containment.

14) A copy of the SWPPP must be available on-site and available to Department inspectors while MSGP coverage is in effect. MSGP coverage may be terminated upon completion of all drilling and hydraulic fracturing operations, fracturing flowback operations and partial site reclamation. Partial site reclamation has occurred when a Minerals inspector verifies that drilling and fracturing equipment has been removed, pits used for those operations have been reclaimed and surface disturbances not associated with production activities have been re-graded and seeded, and vegetative cover re-established. The operator may maintain coverage upon choice. Coverage must be maintained if there has been a discharge of a reportable quantity of oil or a hazardous substance for which notification is required under 40 CFR 11.6, 40 CFR 117.20 or 40 CFR 302.6.

15) Freeboard monitoring is required for any on-site pit and 2 feet of freeboard must be maintained at all times.

16) Fluids must be removed from any on-site pit prior to any 45-day gap in use and the pit must be inspected by a Department inspector prior to resumed use. If the well pad is in a primary or principal aquifer area or within the boundaries of an unfiltered water supply, pit fluids must be removed immediately if operations are suspended and the site will be left unattended.

Drilling, Stimulation and Flowback

NOTE: Wildcat Supplementary Conditions and Fresh Water Aquifer Supplementary Conditions may be separately imposed in addition to these. Unless superseded by more stringent conditions below and/or by the Aquifer Conditions, the Department's Casing and Cementing Practices also remain in effect.

17) Lighting and noise mitigation measures as deemed necessary by the Department may be required at any time.

18) The operator must provide the drilling company with a well prognosis indicating anticipated formation top depths with appropriate warning comments prior to spud. The prognosis must be reviewed by all crew members and posted in a prominent location in the doghouse. The operator must revise the prognosis and inform the drilling company in a timely manner if drilling reveals significant variation between the anticipated and actual geology and/or formation pressures.

19) Individual crew member's responsibilities for blowout control must be posted in the doghouse and each crew member must be made aware of such responsibilities prior to spud.

20) Appropriate pressure control procedures and equipment must be employed while drilling, tripping, logging and running casing into the well.

21) In the event H_2S is encountered, all regulated activities must be conducted by the operator in conformance with American Petroleum Institute Publication API RP49, "Recommended Practices For Safe Drilling of Wells Containing Hydrogen Sulfide."

22) Annular disposal of drill cuttings or fluid is prohibited.

23) All fluids must be contained on the site until properly removed in compliance with the fluid disposal plan approved in accordance with 6 NYCRR 554.1(c)(1) and applicable conditions of this permit.

24) For floodplain locations, a closed loop tank system must be used instead of a reserve pit to manage drilling fluids and cuttings.

25) Only biocides with current registration for use in New York may be used for any operation at the wellsite. Products must be properly labeled, and the label must be kept on-site during application and storage.

26) This office must be notified _____ hours prior to surface casing cementing operations. If the location is within a primary or principal aquifer, cementing cannot commence until a Department inspector is present. *(Blank to be filled in based on well's location and Regional Minerals Manager's direction.)*

27) If intermediate casing is not installed, then production casing must be fully cemented to surface. If intermediate casing is installed, it must be fully cemented to surface and production casing cement must be tied into the intermediate casing string with at least 300 feet of cement. Any request to waive the preceding requirement must be made in writing with supporting documentation and is subject to the Department's approval. The Department will only approve a waiver if open-hole wireline logs and all other information collected during drilling from the same well pad verify that migration of oil, gas or other fluids from one pool or stratum to another will otherwise be prevented. In any event, the top of cement on the production casing must be at least 500 feet above the casing shoe or tied into the previous casing string with at least 300 feet of cement.

28) The operator must run a cement bond log to verify the cement bond on the intermediate casing, if any, and the production casing. Remedial cementing shall be required if the cement bond is not adequate to isolate hydraulic fracturing operations.

29) Under no circumstances should the annulus between the surface casing and the next casing string be shut-in, except during a pressure test.

30) If hydraulic fracturing operations are performed down casing, the casing extending from the surface of the well to the top of the treatment interval must first be tested to at least the maximum anticipated treatment pressure for at least 30 minutes with less than a 5% pressure loss. A record of the pressure test must be maintained by the operator and made available to the Department upon request. The actual treatment pressure must not exceed the test pressure at any time during hydraulic fracturing operations.

31) The operator must record the depths and estimated flow rates where fresh water, brine, oil and/or gas were encountered or circulation was lost during drilling operations. This information and the Department's *Pre-Frac Checklist and Certification* form must be submitted to and received by the regional office at least 48 hours prior to commencement of high-volume hydraulic fracturing operations. The operator may conduct hydraulic fracturing operations provided 1) all items on the checklist are affirmed by a response of "Yes," 2) the *Pre-Frac Checklist And Certification* is received by the Department at least 48 hours in advance and 3) all other pre-frac notification requirements are met as specified elsewhere. The operator is prohibited from conducting hydraulic fracturing operations on the well without additional Department review and approval if a response of "No" is provided to any of the items in the *Pre-Frac Checklist and Certification*.

32) Fracturing products other than those identified in the well permit application materials may not be used without specific approval from this office. The Department will require submission and review of chemical information for any product which has not previously been reviewed, and may require a site-specific environmental assessment and SEQRA determination prior to approving commencement of hydraulic fracturing operations based on a change in fracturing products.

33) Hydraulic fracturing operations must be conducted as follows:

    a) The operator or operator's designated representative must be on site throughout hydraulic fracturing operations,

    b) Secondary containment for fracturing additive containers and staging areas may be required by the Regional Minerals Manager if the proposed location or operation raises a concern about potential liquid chemical releases that is not, in the Department's judgment, sufficiently addressed by the GEIS, the SGEIS, inherent mitigation factors and setbacks. Any such secondary containment must be sufficient to contain 110% of the single largest liquid chemical container within a common staging area,

    c) Hydraulic fracturing additives must be removed from the site if the site will be unattended,

    d) Any frac string, if used, must be either stung into a production liner or run with a packer set at least 100 feet below the deepest cement top. An adequately sized, function tested relief valve and an adequately sized diversion line must be installed and used to divert

flow from the frac string-casing annulus to a lined pit or containment vessel in case of frac string failure. The relief valve must be set to limit the annular pressure to no more than 95% of the lowest internal yield pressure rating of the casing forming the annulus. The annulus between the frac string and casing must be pressurized to at least 250 psig and monitored,

e) The pressure exerted on treating equipment including valves, lines, frac head or tree, casing and frac string, if used, must not exceed 95% of the lowest internal yield pressure rating of the weakest component, and

f) All annuli must be continuously observed or monitored in order to detect pressure or flow, and the records of such maintained by the operator and made available to the Department upon request.

34) The operator must make and maintain a complete record of its hydraulic fracturing operation including the flowback phase, and provide such to the Department upon request at any time during the life of the well (i.e., until the well is permanently plugged and abandoned). The record must include all types and volumes of materials, including additives, pumped into the well and the volume of fluid recovered during the flowback phase. The record must also include a complete description of pressures exhibited throughout the hydraulic fracturing operation and must include pressure recordings, charts and/or a pressure profile. A synopsis of the hydraulic fracturing operation must be provided in the appropriate section of the *Well Drilling and Completion Report.*

35) Flowback water must not be directed to any on-site pit. Steel tanks are required for flowback handling and containment on the well pad. Fluid transfer operations from tanks to tanker trucks must be manned at the truck and at the tank if the tank is not visible to the truck operator from the truck.

36) In no event will flowback water from this location be piped or transported to a centralized surface impoundment located within the boundaries of a primary or principal aquifer or an unfiltered water supply, or a centralized surface impoundment elsewhere that has not been approved by the Department pursuant to a fluid disposal plan in accordance with 6 NYCRR 554.1(c)(1).

37) The venting of any gas originating from the target formation during the flowback phase must be through a flare stack at least 30 feet in height, unless the absence of H2S has been demonstrated at a previous well on the same pad. Vented gas should be ignited whenever possible.

38) This permit authorizes a one-time single-stage or multi-stage high-volume hydraulic fracturing operation as described in the well permit application materials, subject to the *Pre-Frac Checklist and Certification* and any modifications required by the Department. Any subsequent high-volume re-fracturing operations are subject to the Department's approval after:

a) review of the planned fracturing procedures and products, water source, proposed site disturbance and layout, and fluid disposal plans,

b) a site inspection by Department staff, and

c) a determination of whether any other Department permits are required. If MSGP coverage has been terminated, then it must be re-attained prior to any site disturbance associated with high-volume re-fracturing.

Reclamation

39) Fluids must be removed from any on-site pit and the pit reclaimed no later than 45 days after completion of drilling and stimulation operations at the last well on the pad, unless the Department grants an extension pursuant to 6 NYCRR 554.1(c)(2). If the well pad is in a primary or principal aquifer area or within the boundaries of an unfiltered water supply, pit fluids must be removed no later than 7 days after completing drilling and stimulation operations at the last well on the pad. Flowback water must be removed from on-site tanks within the same time frames.

40) Removed pit fluids must be disposed, recycled or reused as described in the approved fluid disposal plan submitted pursuant to 6 NYCRR 554.1(c)(1). Transport of all waste fluids by vehicle must be undertaken by a waste transporter with an approved 6 NYCRR Part 364 permit. The *Drilling and Production Waste Tracking Form* must be completed and retained for three years by the generator, transporter and destination facility, and made available to the Department upon request during this period. If requested, the generator is responsible for producing its originating copy of the *Drilling and Production Waste Tracking Form* and the completed form with the original signatures of the generator, transporter and destination facility.

41) If any fluid or other waste material is moved off site by pipeline or other piping, the operator must maintain a record of the date and time the fluid or other material left the site, the quantity of fluid or other material, and its intended destination and use at that destination or receiving facility.

42) Flowback water piping and conveyances must be constructed of suitable materials, maintained in a leak-free condition, regularly inspected and operated using all appropriate spill control and stormwater pollution prevention practices.

43) Consultation with the Department's Division of Solid and Hazardous Materials is required prior to disposal of any pit solids and pit liner associated with mud-drilling. Any sampling and analysis directed by DSHM must be by an ELAP-certified laboratory. Disposal must conform to all applicable Department regulations. The pit liner must be ripped and perforated prior to any permitted burial on-site. Permission of the surface owner is required for any on-site burial of pit solids and pit liner, regardless of type of drilling and fluids used. Burial of any other trash on-site is specifically prohibited and all such trash must be removed from the site and properly disposed. Transport of all pit solids and pit liner off-site, if required by the Department or otherwise performed, must be undertaken by a waste transporter with an approved 6 NYCRR Part 364 permit. The *Drilling and Production Waste Tracking Form* must be completed and retained for three years by the generator, transporter and destination facility, and made available to the Department upon request during this period. If requested, the generator is responsible for producing its originating copy of the *Drilling and Production Waste Tracking Form* and the completed form with the original signatures of the generator, transporter and destination facility.

44) Unless otherwise approved by this office, well pads and access roads constructed for drilling and production operations must be scarified or ripped to alleviate compaction prior to

replacement of topsoil. Reclaimed areas must be seeded and mulched after topsoil replacement. Any proposal by the operator to waive these reclamation requirements must be accompanied by documentation of the landowner's written request to keep the access road and/or well pad.

General

45) The operator must complete the "Record of Formations Penetrated" on the Well Drilling and Completion Report providing a log of formations, both unconsolidated and consolidated, and depths and estimated flow rates of any fresh water, brine, oil and/or gas.

46) Any non-routine incident must be verbally reported to the Department within two hours of the incident's occurrence or discovery, with a written report detailing the non-routine incident to follow within twenty-four hours of the incident's occurrence or discovery. Non-routine incidents include, but are not limited to: casing, drill pipe or frac equipment failures, cement failures, fishing jobs, fires, seepages, blowouts, surface chemical spills, observed leaks in surface equipment, observed pit liner failure, surface effects at previously plugged or unknown wells, observed effects at water wells or at the surface, complaints of water well contamination or other potentially polluting non-routine incident or incident that may affect the health, safety, welfare, or property of any person.

47) Fluids recovered after high volume hydraulic fracturing operations must be tested for NORM during flowback operations prior to removal from the site. Fluids recovered during the production phase (i.e., produced brine) must be tested for NORM prior to removal, and the ground adjacent to the tanks must be measured for radioactivity. All testing must be in accordance with protocols satisfactory to NYSDOH.

48) Produced brine which is removed from the site must be disposed, recycled or reused as described by the well permit application materials. Transport of all waste fluids must be undertaken by a waste transporter with an approved 6 NYCRR Part 364 permit. The *Drilling and Production Waste Tracking Form* must be completed and retained for three years by the generator, transporter and destination facility, and made available to the Department upon request during this period. If requested, the generator is responsible for producing its originating copy of the *Drilling and Production Waste Tracking Form* and the completed form with the original signatures of the generator, transporter and destination facility.

Any deviation from the above conditions must be approved by the Department prior to making a change.

New York State

DEC

Division of Mineral Resources

Appendix 11

Analysis of Subsurface Mobility of Fracturing Fluids

Excerpted from ICF International, Task 1, 2009

Draft Supplemental Generic Environmental Impact Statement

1.2.4 Principles governing fracturing fluid flow

The mobility of hydraulic fracturing fluid depends on the same physical and chemical principles that dictate all fluid transport phenomena. Frac fluid will flow through the well, the fractures, and the porous media based on pressure differentials and hydraulic conductivities. In addition to the overall flow of the frac fluids, additives may experience greater or lesser movement due to diffusion and adsorption. The concentrations of the fluids and additives may change due to dilution in formation waters and possibly by biological or chemical degradation.

1.2.4.1 Limiting conditions

The analyses below present flow calculations for a range of parameters, with the intent to define reasonable bounds for the conditions likely to be encountered in New York State. Although one or more conditions at some future well sites may lie outside of the ranges analyzed, it is considered unlikely that the combination of conditions at any site would produce environmental impacts that are significantly more adverse than the worst case scenarios analyzed. The equations used in the analyses are presented below to facilitate the assessment of additional scenarios.

The analyses consider potentially useful aquifers with lower limits at depths up to 1,000 feet, somewhat deeper than the maximum aquifer depth reported in Table 3 for the Marcellus Shale. Similarly, the minimum depth to the top of the shale is taken as 2,000 ft, well above the minimum depth reported in Table 3 for the Marcellus Shale. The 2,000 ft. depth has been postulated as the probable upper limit for economic development of the New York shales.

The analyses include an additional conservative assumption. Even for deep aquifers, the analyses consider the pore pressure at the bottom of the aquifer to be zero as if a deep well or well field was operating at maximum drawdown. This assumption maximizes the potential for upward flow of fracturing fluid or its components from the fracture zone to the aquifer.

[134] U.S. EPA, 2004. *Evaluation of Impacts to Underground Sources of Drinking Water by Hydraulic Fracturing of Coalbed Methane Reservoirs*, Report number: EPA 816-R-04-003.

1.2.4.2 Gradient

For a fracturing fluid or its additives to have a negative impact on a groundwater aquifer, some deleterious component of the fracturing fluid would need to travel from the target fracture zone to the aquifer. In order for fluid to flow from the fracture zone to an aquifer, the *total head*[135] must be greater in the fracture zone than at the well. We can estimate the *gradient*[136] that might exist between a fracture zone in the shale and a potable water aquifer as follows:

$$i = \frac{h_{t1} - h_{t2}}{L} \quad (1)$$

where i = gradient
h_{tn} = total head at Point n
L = length of flow path from Point 1 to Point 2

Since the total head is the sum of the elevation head and the pressure head,

$$h_t = h_e + h_p \quad (2)$$

The gradient can be restated as

$$i = \frac{\left(h_{e1} + h_{p1}\right) - \left(h_{e2} + h_{p2}\right)}{L} \quad (3)$$

where h_{en} = elevation head at Point n
h_{pn} = pressure head at Point n

If the ground surface is taken as the elevation datum, we can express the elevation head in terms of depth.

$$d_n = -h_{en} \quad (4)$$

Restating the gradient yields

$$i = \frac{\left(h_{e1} + h_{p1}\right) - \left(h_{e2} + h_{p2}\right)}{L} = \frac{\left(-d_1 + h_{p1}\right) - \left(-d_2 + h_{p2}\right)}{L} = \frac{\left(d_2 - d_1\right) + \left(h_{p1} - h_{p2}\right)}{L} \quad (5)$$

where d_n = depth at Point n

We can estimate the maximum likely gradient by considering the combination of parameters which would be most favorable to flow from the hydraulically fractured zone to a potential groundwater aquifer. These include assuming the minimum possible pressure head in the aquifer and the shortest possible flow path, i.e. setting h_{p2} to zero to simulate a well pumped to the maximum aquifer drawdown and setting L to the vertical distance between the fracture zone and the aquifer, $d_1 - d_2$.

[135] Total head at a point is the sum of the elevation at the point plus the pore pressure expressed as the height of a vertical column of water.
[136] The groundwater gradient is the difference in total head between two points divided by the distance between the points.

The gradient now becomes

$$i = \frac{(d_2 - d_1) + h_{p1}}{|d_1 - d_2|} \quad (6)$$

The total vertical stress in the fracture zone equals

$$\sigma_v = d_1 \times \gamma_R \quad (7)$$

where σ_v = total vertical stress
d_1 = depth at Point 1, in the fracture zone
γ_R = average total unit weight of the overlying rock

The effective vertical stress, or the stress transmitted through the mineral matrix, equals the total unit weight minus the pore pressure. For the purposes of this analysis, the pore pressure is taken to be equivalent to that of a vertical water column from the fracture zone to the surface. The effective vertical stress is given by

$$\sigma'_v = \sigma_v - (d_1 \times \gamma_W) \quad (8)$$

where σ'_v = effective vertical stress
γ_W = unit weight of water

The effective horizontal stress and the total horizontal stress therefore equal

$$\sigma'_h = K \times \sigma'_v \quad (9)$$

$$\sigma_h = \sigma'_h + (d_1 \times \gamma_W) \quad (10)$$

where σ'_h = effective horizontal stress
K = ratio of horizontal to vertical stress
σ_h = total horizontal stress

The hydraulic fracturing pressure needs to exceed the minimum total horizontal stress. Allowing for some loss of pressure from the wellbore to the fracture tip, the pressure head in the fracture zone equals

$$h_{p1} = c \times \sigma_h = \frac{c \times d_1 \times [K(\gamma_R - \gamma_W) + \gamma_W]}{\gamma_W} \quad (11)$$

where h_{p1} = pressure head at Point 1, in the fracture zone
c = coefficient to allow for some loss of pressure from the wellbore to the fracture tip

Since the horizontal stress is typically in the range of 0.5 to 1.0 times the vertical stress, the fracturing pressure will equal the depth to the fracture zone times, say, 0.75 times the density of

the geologic materials (estimated at 150 pcf average), times the depth.[137] To allow for some loss of pressure from the wellbore to the fracture tip, the calculations assume a fracturing pressure 10% higher than the horizontal stress, yielding

$$h_{p1} = \frac{110\% \times d_1 \times [0.75(150\,pcf - 62.4\,pcf) + 62.4\,pcf]}{62.4\,pcf} = 2.26 d_1 \quad (12)$$

Equation (6) thus becomes

$$i = \frac{(d_2 - d_1) + 2.26 d_1}{|d_1 - d_2|} = \frac{d_2 + 1.26 d_1}{|d_1 - d_2|} \quad (13)$$

Figure 1 shows the variation in the average hydraulic gradient between the fracture zone and an overlying aquifer during hydraulic fracturing for a variety of aquifer and shale depths. The gradient has a maximum of about 3.5, and is less than 2.0 for most depth combinations.

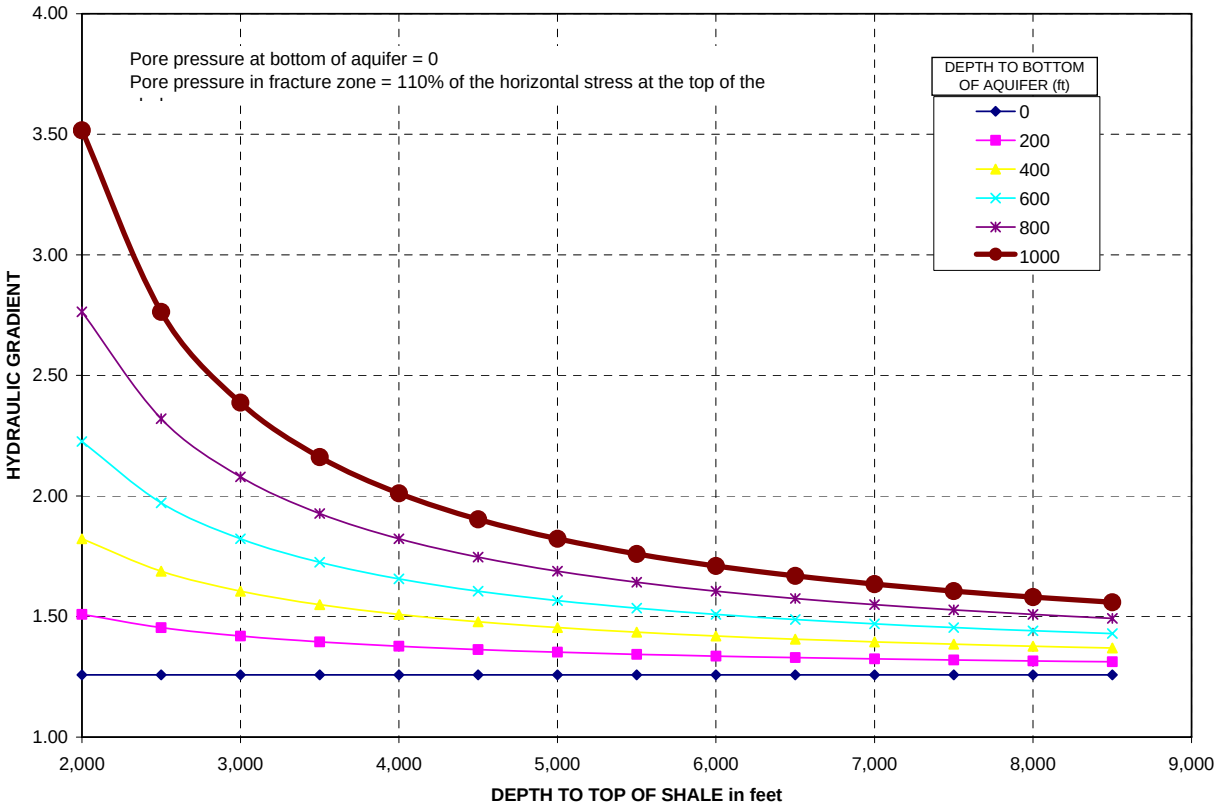

Figure 1: Average hydraulic gradient during fracturing

In an actual fracturing situation, non-steady state conditions will prevail during the limited time of application of the fracturing pressures, and the gradients will be higher than the average closer

[137] Zhang, Lianyang, 2005. *Engineering Properties of Rocks*, Elsevier Geo-Engineering Book Series, Volume 4, Amsterdam.

to the fracture zone and lower than the average closer to the aquifer. It is important to note that these gradients only apply while fracturing pressures are being applied.

Once fracturing pressures are removed, the total head in the reservoir will fall to near its original value, which may be higher or lower than the total head in the aquifer. Evidence suggests that the permeabilities of the Devonian shales are too low for any meaningful hydrological connection with the post-Devonian formations. The high dissolved solid content near 300,000 ppm in pre-Late Devonian formations supports the concept that these formations are hydrologically discontinuous, i.e. not well-connected to other formations.[138] During production, the pressure in the shale would decrease as gas is extracted, further reducing any potential for upward flow.

1.2.4.3 Seepage velocity

The second aspect to consider with regards to flow is the time required for a particle of fluid to flow from the fracture zone to the well. Using Darcy's law, the seepage velocity would equal

$$v = \frac{ki}{n} \tag{10}$$

where v = seepage velocity
k = hydraulic conductivity
n = porosity

The average hydraulic conductivity between a fracture zone and an aquifer would depend on the hydraulic conductivity of each intervening stratum, which in turn would depend on the type of material and whether it was intact or fractured. The rock types overlying the Marcellus Shale are primarily sandstones and other shales.[139] Table 4 lists the range of hydraulic conductivities for sandstone and shale rock masses. The hydraulic conductivity of rock masses tends to decrease with depth as higher stress levels close or prevent fractures. Vertical flow across a horizontally layered system of geologic strata is controlled primarily by the less permeable strata, so the average vertical hydraulic conductivity of all the strata lying above the target shale would be expected to be no greater than 1E-5 cm/sec and could be substantially lower.

Table 4: Hydraulic conductivity of rock masses[140]

Material	Minimum k	Maximum k
Intact Sandstone	1E-8 cm/sec	1E-5 cm/sec
Sandstone rock mass	1E-9 cm/sec	1E-1 cm/sec
Intact Shale	1E-11 cm/sec	1E-9 cm/sec
Shale rock mass	1E-9 cm/sec	1E-4 cm/sec

Figure 2 shows the seepage velocity from the fracture zone to an overlying aquifer based on the average gradients shown in Figure 1 over a range of hydraulic conductivity values and for the maximum aquifer depth of 1000 feet. For all lesser aquifer depths, the seepage velocity would

[138] Russell, William L., 1972, "Pressure-Depth Relations in Appalachian Region", *AAPG Bulletin*, March 1972, v. 56, No. 3, p. 528-536.
[139] Arthur, J.D., et al, 2008. "Hydraulic Fracturing Considerations for Natural Gas Wells of the Marcellus Shale," Presented at Ground Water Protection Council 2008 Annual Forum, September 21-24, 2008, Cincinnati, Ohio.
[140] Zhang, Lianyang, 2005. *Engineering Properties of Rocks*, Elsevier Geo-Engineering Book Series, Volume 4, Amsterdam.

be lower. For all of the analyses presented in this report, the porosity is taken as 10%, the reported total porosity for the Marcellus Shale.[141] Total porosity equals the contribution from both micro-pores within the intact rock and void space due to fractures. For the overlying strata, the analyses also use the same value for total porosity of 10% which is in the lower range of the typical values for sandstones and shales. This may result in a slight overestimation of the calculated seepage velocity, and an underestimation of the required travel time and available pore storage volume.

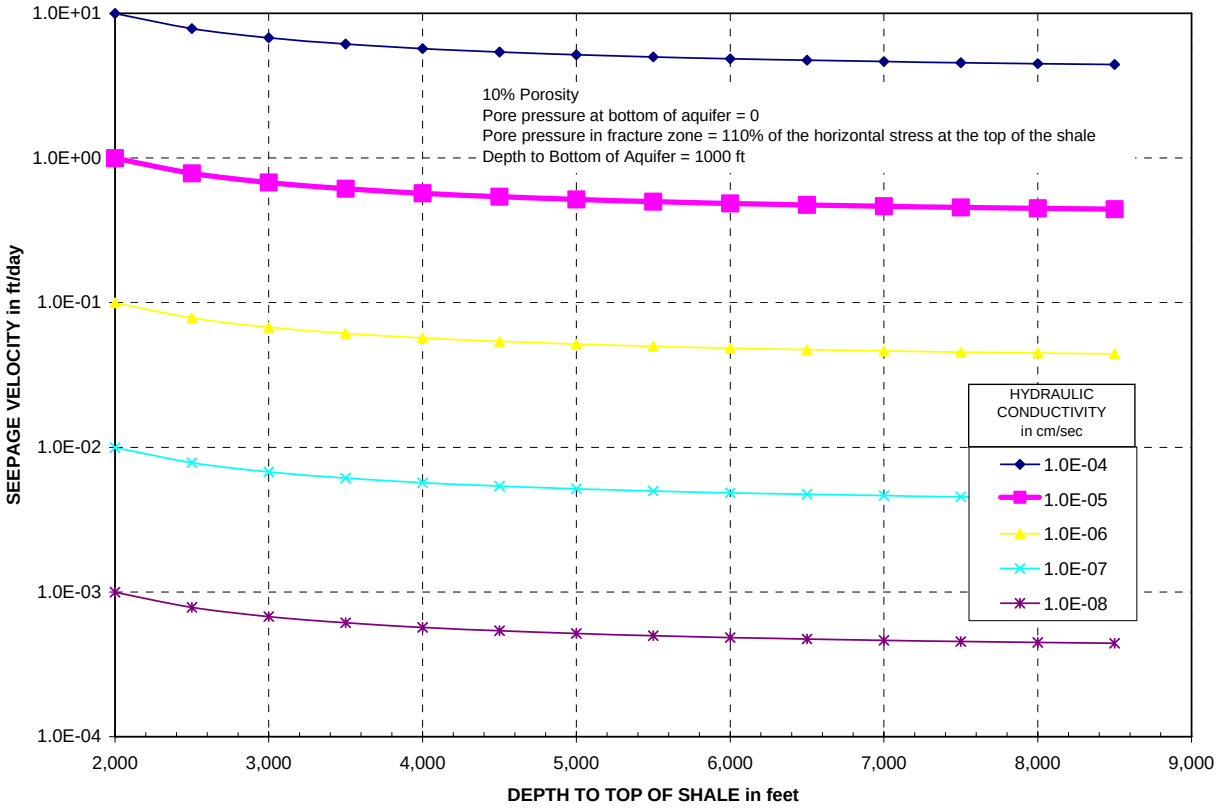

Figure 2: Seepage velocity as a function of hydraulic conductivity

Figure 2 shows that the seepage of hydraulic fracturing fluid would be limited to no more than 10 feet per day, and would be substantially less under most conditions. Since the cumulative amount of time that the fracturing pressure would be applied for all steps of a typical fracture stage is less than one day, the corresponding seepage distance would be similarly limited.

It is important to note that the seepage velocities shown in Figure 2 are based on average gradients between the fracture zone and the overlying aquifer. The actual gradients and seepage velocities will be influenced by non-steady state conditions and by variations in the hydraulic conductivities of the various strata.

[141] DOE, Office of Fossil Energy, 2009. *State Oil and National Gas Regulations Designed to Protect Water Resources*, May 2009.

1.2.4.4 Required travel time

The time that the fracturing pressure would need to be maintained for the fracturing fluid to flow from the fracture zone to an overlying aquifer is given by

$$t = \frac{|d_2 - d_1|}{v} \tag{11}$$

where t = required travel time

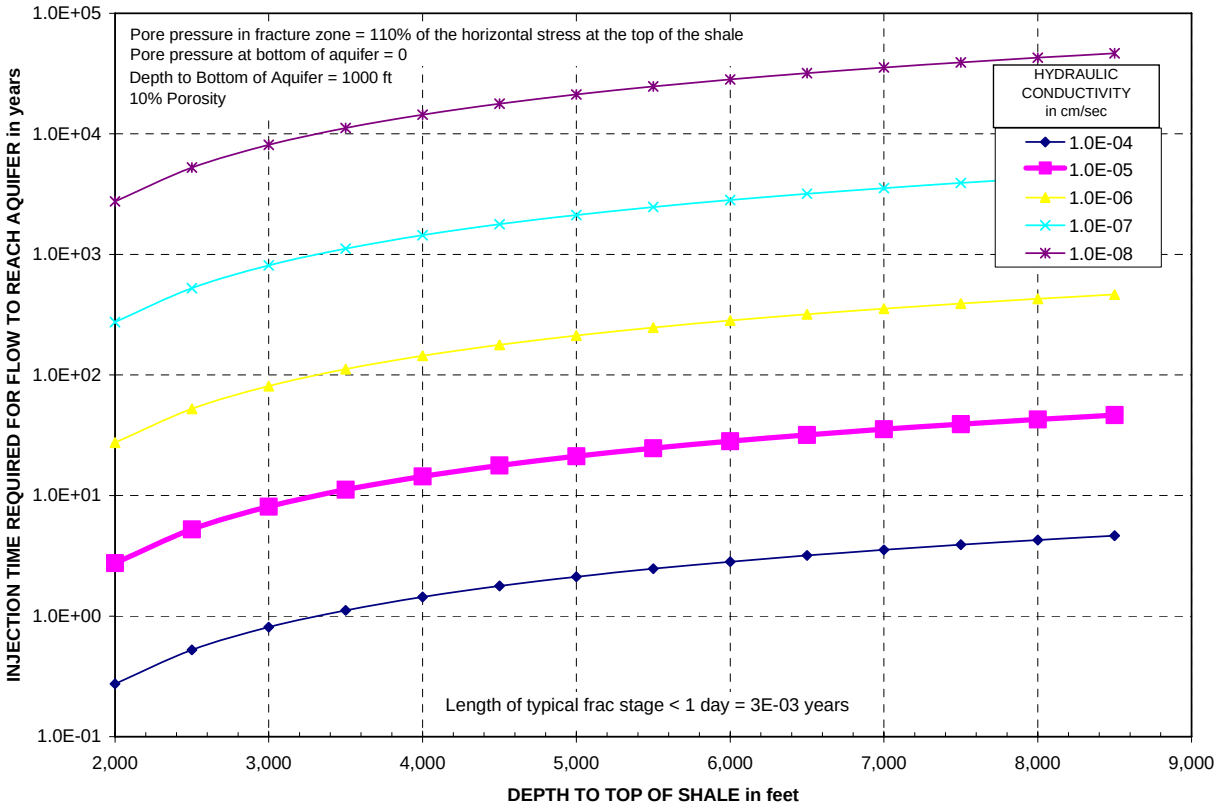

Figure 3: Injection time required for fracture fluid to reach aquifer as a function of hydraulic conductivity

Figure 3 shows the required travel time based on the average gradients shown in Figure 1 over a range of hydraulic conductivity values and for the maximum aquifer depth of 1000 feet. For all lesser aquifer depths, the required flow time would be longer. The required flow times under the fracturing pressure is several orders of magnitude greater than the duration over which the fracturing pressure would be applied.

Figure 4 presents the results of a similar analysis, but with the hydraulic conductivity held at 1E-5 cm/sec and considering various depths to the bottom of the aquifer. Compared to a 1000 ft. deep aquifer, 10 to 20 more years of sustained fracturing pressure would be required for the fracturing fluid to reach an aquifer that was only 200 ft. deep.

The required travel times shown relate to the movement of the groundwater. Dissolved chemicals would move at a slower rate due to retardation. The retardation factor, which is the

ratio of the chemical movement rate compared to the water movement rate, is always between 0.0 and 1.0, so the required travel times for any dissolved chemical would be greater than those shown in Figures 3 and 4.

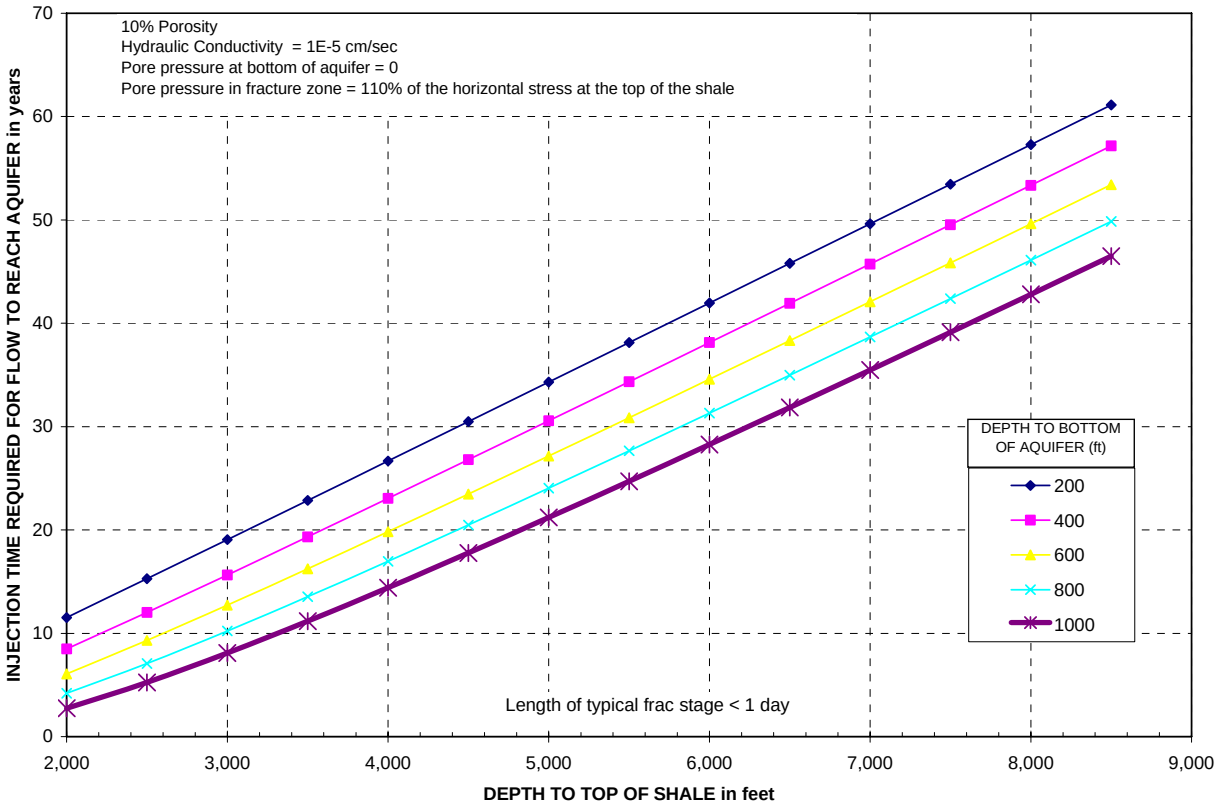

Figure 4: Injection time required for flow to reach aquifer as a function of aquifer depth

1.2.4.5 Pore storage volume

The fourth aspect to consider in evaluating the potential for adverse impacts to overlying aquifers is the volume of fluid injected compared to the volume of the void spaces and fractures that the fluid would need to fill in order to flow from the fracture zone to the aquifer. Figure 5 shows the void volume based on 10% total porosity for the geologic materials for various combinations of depths for the bottom of an aquifer and for the top of the shale, calculated as follows:

$$V = \left|d_1 - d_2\right| \times n \times \frac{43{,}560\ ft^2}{acre} \times \frac{7.48 gal}{ft^3} \qquad (12)$$

where V = volume of void spaces and fractures

A typical slickwater fracturing treatment in a horizontal well would use less than 4 million gallons of fracturing fluid, and some portion of this fluid would be recovered as flowback. The void volume, based on 10% total porosity, for the geologic materials between the bottom of an aquifer at 1,000 ft. depth and the top of the shale at a 2,000 ft. depth is greater than 32 million gallons per acre. Since the expected area of a well spacing unit is no less than the equivalent of

40 acres per well,[142,143,144,145] the fracturing fluid could only fill about 0.3% of the overall void space. Alternatively, if the fracturing fluid were to uniformly fill the overall void space, it would be diluted by a factor of over 300. As shown in Figure 5, for shallower aquifers and deeper shales, the void volume per acre is significantly greater.

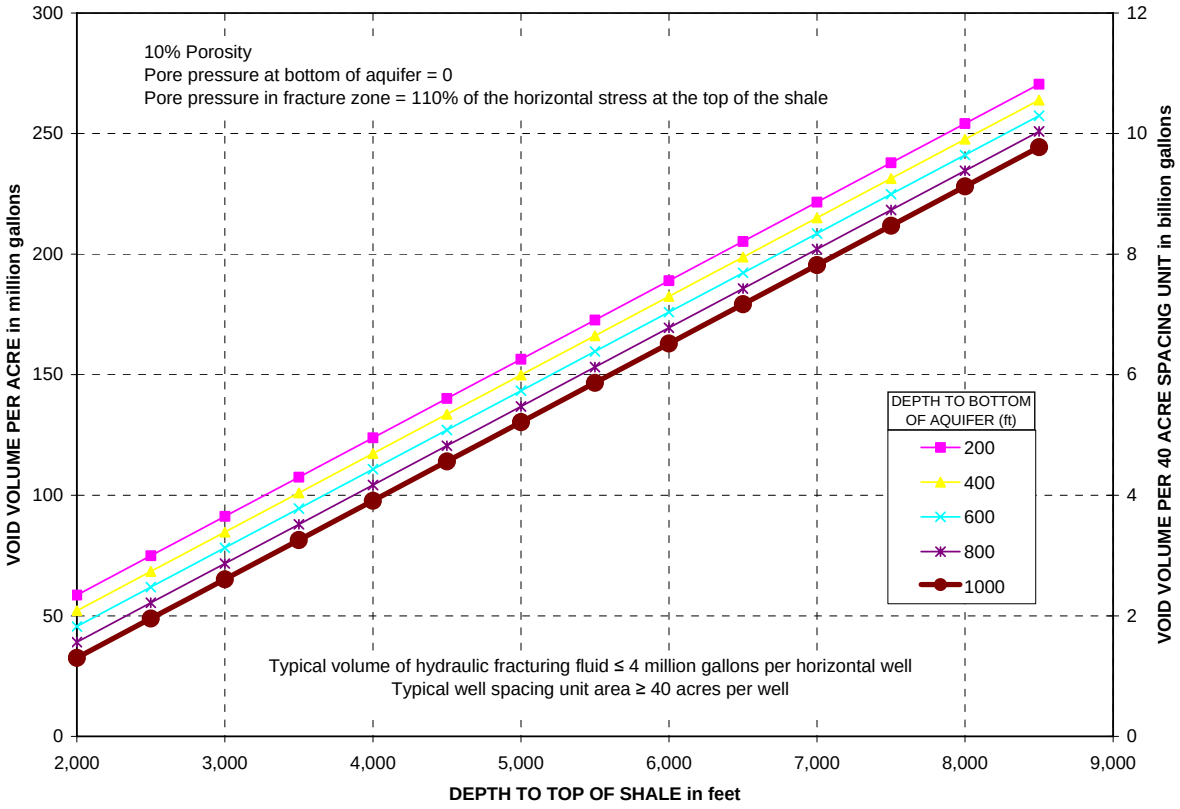

Figure 5: Comparison of void volume to frac fluid volume

1.2.5 Flow through fractures, faults, or unplugged borings

It is theoretically possible but extremely unlikely that a flow path such as a network of open fractures, an open fault, or an undetected and unplugged wellbore could exist that directly connects the hydraulically fractured zone to an aquifer. The open flow path would have a much smaller area of flow leading to the aquifer and the resistance to flow would be lower. In such an improbable case, the flow velocity would be greater, the time required for the fracturing fluid to reach the aquifer would be shorter, and the storage volume between the fracture zone and the aquifer would be less than in the scenarios described above. The probability of such a combination of unlikely conditions occurring simultaneously (deep aquifer, shallow fracture

[142] Infill wells could result in local increases in well density.
[143] New York regulations (Part 553.1 Statewide spacing) require a minimum spacing of 1320 ft. from other oil and gas wells in the same pool. This spacing equals 40 acres per well for wells in a rectangular grid.
[144] New York Codes, Rules, and Regulations, Title 6 Department of Environmental Conservation, Chapter V Resource Management Services, Subchapter B Mineral Resources, 6 NYCRR Part 553.1 Statewide spacing, (as of 5 April 2009).
[145] NYSDEC, 2009, "Final Scope for Draft Supplemental Generic Environmental Impact Statement (dSGEIS) on the Oil, Gas And Solution Mining Regulatory Program, Well Permit Issuance For Horizontal Drilling and High-Volume Hydraulic Fracturing to Develop the Marcellus Shale and Other Low-permeability Gas Reservoirs", February 2009.

zone, and open flow path) is very small. The fracturing contractor would notice an anomaly if these conditions led to the inability to develop or maintain the predicted fracturing pressure.

During flowback, the same conditions would result in a high rate of recapture of the frac fluid from the open flow path, decreasing the potential for any significant adverse environmental impacts. Moreover, during production the gradients along the open flow path would be toward the production zone, flushing any stranded fracturing fluid in the fracture or unplugged wellbore back toward the production well.

1.2.6 Geochemistry

The ability of the chemical constituents of the additives in fracturing fluids to migrate from the fracture zone are influenced not just by the forces governing the flow of groundwater, but also by the properties of the chemicals and their interaction with the subterranean environment. In addition to direct flow to an aquifer, the constituents of fracturing fluid would be affected by limitations on solubility, adsorption and diffusion.

1.2.6.1 Solubility

The solubility of a substance indicates the propensity of the substance to dissolve in a solvent, in this case, groundwater. The substance can continue to dissolve up to its saturation concentration, i.e. its solubility. Substances with high solubilities in water have a higher likelihood of moving with the groundwater flow at high concentrations, whereas substances with low solubilities may act as longer term sources at low level concentrations. The solubilities of many chemicals proposed for use in hydraulic fracturing in New York State are not well established or are not available in standard databases such as the IUPAC-NIST Solubility Database.[146]

The solubility of a chemical determines the maximum concentration of the chemical that is likely to exist in groundwater. Solubility is temperature dependent, generally increasing with temperature. Since the temperature at the depths of the gas shales is higher than the temperature closer to the surface where a usable aquifer may lie, the solubility in the aquifer will be lower than in the shale formation.

Given the depth of the New York gas shales and the distance between the shales and any overlying aquifer, chemicals with high solubilities would be more likely to reach an aquifer at higher concentrations than chemicals of low solubility. Based on the previously presented fluid flow calculations, the concentrations would be significantly lower than the initial solubilities due to dilution.

1.2.6.2 Adsorption

Adsorption occurs when molecules of a substance bind to the surface of another material. As chemicals pass through porous media or narrow fractures, some of the chemical molecules may adsorb onto the mineral surface. The adsorption will retard the flow of the chemical constituents relative to the rate of fluid flow. The retardation factor, expressed as the ratio of the fluid flow velocity to the chemical movement velocity, generally is higher in fine grained materials and in materials with high organic content. The Marcellus shale is both fine grained and of high organic content, so the expected retardation factors are high. The gray shales overlying the Marcellus

[146] IUPAC-NIST Solubility Database, Version 1.0, NIST Standard Reference Database 106, URL: http://srdata.nist.gov/solubility/index.aspx.

shale would also be expected to substantially retard any upward movement of fracturing chemicals.

The octanol-water partition coefficient, commonly expressed as K_{ow}, is often used in environmental engineering to estimate the adsorption of chemicals to geologic materials, especially those containing organic materials. Chemicals with high partition coefficients are more likely to adsorb onto organic solids and become locked in the shale, and less likely to remain in the dissolve phase than are chemicals with low partition coefficients.

The partition coefficients of many chemicals proposed for use in hydraulic fracturing in New York State are not well established or are not available in standard databases. The partition coefficient is inversely proportional to solubility, and can be estimated from the following equation[147]

$$\log K_{ow} = -0.862 \log S_w + 0.710 \quad (13)$$

where K_{ow} = octanol-water partition coefficient
S_w = solubility in water at 20ºC in mol/liter

Adsorption in the target black shales or the overlying gray shales would effectively remove some percentage of the chemical mass from the groundwater for long periods of time, although as the concentration in the water decreased some of the adsorbed chemicals could repartition back into the water. The effect of adsorption could be to lower the concentration of dissolved chemicals in any groundwater migrating from the shale formation.

1.2.6.3 Diffusion

Through diffusion, chemicals in fracturing fluids would move from locations with higher concentrations to locations with lower concentrations. Diffusion may cause the transport of chemicals even in the absence of or in a direction opposed to the gradient driving fluid flow. Diffusion is a slow process, but may continue for a very long time. As diffusion occurs, the concentration necessarily decreases. If all diffusion were to occur in an upward direction (an unlikely, worst-case scenario) from the fracture zone to an overlying freshwater aquifer, the diffused chemical would be dispersed within the intervening void volume and be diluted by at least an average factor of 160 based on the calculated pore volumes in Section 1.2.4.5. Since a concentration gradient would exist from the fracture zone to the aquifer, the concentration at the aquifer would be significantly lower than the calculated average. Increased vertical distance between the aquifer and the fracture zone due to shallower aquifers and deeper shales would further increase the dilution and reduce the concentration reaching the aquifer.

1.2.6.4 Chemical interactions

Mixtures of chemicals in a geologic formation will behave differently than pure chemicals analyzed in a laboratory environment, so any estimates based on the solubility, adsorption, or diffusion properties of individual chemicals or chemical compounds should only be used as a guide to how they might behave when injected with other additives into the shale. Co-solubilities can change the migration properties of the chemicals and chemical reactions can create new compounds.

[147] Chiou, Cary T., *Partition and adsorption of organic contaminants in environmental systems*, John Wiley & Sons, New York, 2002, p.57.

1.2.7 Conclusions

Analyses of flow conditions during hydraulic fracturing of New York shales help explain why hydraulic fracturing does not present a reasonably foreseeable risk of significant adverse environmental impacts to potential freshwater aquifers. Specific conditions or analytical results supporting this conclusion include:

- The developable shale formations are separated from potential freshwater aquifers by at least 1,000 feet of sandstones and shales of moderate to low permeability.
- The fracturing pressures which could potentially drive fluid from the target shale formation toward the aquifer are applied for short periods of time, typically less than one day per stage, while the required travel time for fluid to flow from the shale to the aquifer under those pressures is measured in years.
- The volume of fluid used to fracture a well could only fill a small percentage of the void space between the shale and the aquifer.
- Some of the chemicals in the additives used in hydraulic fracturing fluids would be adsorbed by and bound to the organic-rich shales.
- Diffusion of the chemicals throughout the pore volume between the shale and an aquifer would dilute the concentrations of the chemicals by several orders of magnitude.
- Any flow of frac fluid toward an aquifer through open fractures or an unplugged wellbore would be reversed during flowback, with any residual fluid further flushed by flow toward the production zone as pressures decline in the reservoir during production.

The historical experience of hydraulic fracturing in tens of thousands of wells is consistent with the analytical conclusion. There are no known incidents of groundwater contamination due to hydraulic fracturing.

New York State

DEC

Division of Mineral Resources

Appendix 12

Beneficial Use Determination (BUD) Notification Regarding Roadspreading

Draft Supplemental Generic Environmental Impact Statement

New York State Department of Environmental Conservation
Division of Solid and Hazardous Materials
Bureau of Solid Waste, Reduction and Recycling, 9th Floor
625 Broadway, Albany, New York 12233-7253
Phone: (518) 402-8704 • **FAX:** (518) 402-9024
Website: www.dec.ny.gov

Alexander B. Grannis
Commissioner

January 2009

NOTICE TO GAS AND OIL WELL & LPG STORAGE FLUID HAULERS

All gas or oil well drilling and production fluids including but not limited to brine and fracturing fluids, and brine from liquefied petroleum gas (LPG) well storage operations, transported for disposal, road spreading, reuse in another gas or oil well, or recycling must be specifically identified in Part C and D of the New York State Waste Transporter Permit Application Form. Transporters must identify the type of fluid proposed to be transported in Section C in the Non-Hazardous Industrial/Commercial box and the Disposal or Destination Facility (or Use) in Part D.

Fracture fluids obtained during flowback operations may not be spread on roads and must be disposed at facilities authorized by the Department. Such disposal facilities must be identified in Part D of the permit application. If fluids are to be transported for use or reuse at another gas or oil well, that location must be identified in Part D of the permit application.

With respect to fluids transported under a Waste Transporter Permit, only production brines or brine from LPG storage operations may be used for road spreading. Drilling, fracing, and plugging fluids are not acceptable for road spreading.

Any person, including any government entity, applying for a Part 364 permit or permit modification to use production brine from oil or gas wells or brine from LPG well storage operations for road spreading purposes (i.e. road de-icing, dust suppression, or road stabilization) must submit a petition for a beneficial use determination (BUD). If a contract hauler is applying for a Part 364 permit or permit modification to deliver brine to a government agency for road spreading purposes, that government agency must submit the BUD petition. The BUD must be granted and the Part 364 permit/modification must be issued before brine can be removed from the well or LPG storage site for road spreading purposes or storage at an offsite facility.

The BUD petition must include:

1. An original letter signed and dated by the government agency representative or other property owner authorizing the use of brine on the locations identified in below item 3.

2. The name, address and telephone number of the person, company or government official seeking the approval.

3. An identification (or map) of the specific roads or other areas that are to receive the brine and any brine storage locations, excluding the well site storage locations.

4. The physical address of the brine storage locations from which the brine is hauled.

5. For each well field or LPG storage facility, a chemical analysis of a representative sample of the brine performed by a NYSDOH approved laboratory for the following parameters: calcium, sodium, chloride, magnesium, total dissolved solids, pH, iron, barium, lead, sulfate, oil & grease, benzene, ethylbenzene, toluene, and xylene. Depending upon the analytical results, the Department may require additional analyses. (This analysis is not required for brine from a LPG well operation with a valid New York State SPDES permit.)

6. A road spreading plan that includes a description of the procedures to prevent the brine from flowing or running off into streams, creeks, lakes and other bodies of water. The plan should include:

- a description of how the brine will be applied, including the equipment to be used and the method for controlling the rate of application. In general this should indicate that the brine is applied by use of a spreader bar or similar spray device with shut-off controls in the cab of the truck; and with vehicular equipment that is dedicated to this use or cleaned of previously transported waste materials prior to this use;
- the proposed rate and frequency of application;
- a description of application restrictions. For dust control and road stabilization use this description should indicate that the brine is not applied: after daylight hours; within 50 feet of a stream, creek, lake or other body of water; on sections of road having a grade exceeding 10 percent; or on wet roads, during rain, or when rain is imminent. For road deicing use, this description should indicate that the brine is applied in accordance NYSDOT Guidelines for Anit-Icing with Liquids and include any other restrictions.

7. Where applicable, a brine storage plan that includes:

- a description of the type, material, size, and number of storage tanks and the maximum anticipated storage;
- procedures for run off and run-on control;
- provisions for secondary containment; and
- a contingency plan.

If you have any questions concerning your permit, please feel free to call this office at (518) 402-8707. You may also visit our public website at the address above for information and forms to download or print.

Waste Transporter Permit Program

New York State

DEC

Division of Mineral Resources

Appendix 13

NYS Marcellus Radiological Data From Production Brine

Draft Supplemental Generic Environmental Impact Statement

NYS Marcellus Radiological Data from Production Brine

Well	API #	Date Collected	Town (County)	Parameter	Result +/- Uncertainty
Maxwell 1C	31-101-22963-03-01	10/7/2008	Caton (Steuben)	Gross Alpha	17,940 +/- 8,634 pCi/L
				Gross Beta	4,765 +/- 3,829 pCi/L
				Cesium-137	-2.26 +/- 5.09 pCi/L
				Cobalt-60	-0.748 +/- 4.46 pCi/L
				Ruthenium-106	9.27 +/- 46.8 pCi/L
				Zirconium-95	37.8 +/- 21.4 pCi/L
				Radium-226	2,472 +/- 484 pCi/L
				Radium-228	874 +/- 174 pCi/L
				Thorium-228	53.778 +/- 8.084 pCi/L
				Thorium-230	0.359 +/- 0.221 pCi/L
				Thorium-232	0.065 +/- 0.103 pCi/L
				Uranium-234	0.383 +/- 0.349 pCi/L
				Uranium-235	0.077 +/- 0.168 pCi/L
				Uranium-238	0.077 +/- 0.151 pCi/L
Frost 2	31-097-23856-00-00	10/8/2008	Orange (Schuyler)	Gross Alpha	14,530 +/-3,792 pCi/L
				Gross Beta	4,561 +/- 1,634 pCi/L
				Cesium-137	2.54 +/- 4.64 pCi/L
				Cobalt-60	-1.36 +/- 3.59 pCi/L
				Ruthenium-106	-9.03 +/- 36.3 pCi/L
				Zirconium-95	31.6 +/- 14.6 pCi/L
				Radium-226	2,647 +/- 494 pCi/L
				Radium-228	782 +/- 157 pCi/L
				Thorium-228	47.855 +/- 9.140 pCi/L
				Thorium-230	0.859 +/- 0.587 pCi/L
				Thorium-232	0.286 +/- 0.328 pCi/L
				Uranium-234	0.770 +/- 0.600 pCi/L
				Uranium-235	0.113 +/- 0.222 pCi/L
				Uranium-238	0.431 +/- 0.449 pCi/L
Webster T1	31-097-23831-00-00	10/8/2008	Orange (Schuyler)	Gross Alpha	123,000 +/- 23,480 pCi/L
				Gross Beta	12,000 +/- 2,903 pCi/L
				Cesium-137	1.32 +/- 5.76 pCi/L
				Cobalt-60	-2.42 +/- 4.76 pCi/L
				Ruthenium-106	-18.3 +/- 44.6 pCi/L
				Zirconium-95	34.5 +/- 15.6 pCi/L
				Radium-226	16,030 +/- 2,995 pCi/L
				Radium-228	912 +/- 177 pCi/L
				Thorium-228	63.603 +/- 9.415 pCi/L
				Thorium-230	0.783 +/- 0.286 pCi/L
				Thorium-232	0.444 +/- 0.213 pCi/L
				Uranium-234	0.232 +/- 0.301 pCi/L
				Uranium-235	0.160 +/- 0.245 pCi/L
				Uranium-238	-0.016 +/- 0.015 pCi/L

Well	API #	Date Collected	Town (County)	Parameter	Result +/- Uncertainty
Calabro T1	31-097-23836-00-00	3/26/2009	Orange (Schuyler)	Gross Alpha	18,330 +/- 3,694 pCi/L
				Gross Beta	-324.533 +/- 654 pCi/L
				Cesium-137	3.14 +/- 7.19 pCi/L
				Cobalt-60	0.016 +/- 5.87 pCi/L
				Ruthenium-106	17.0 +/- 51.9 pCi/L
				Zirconium-95	24.2 +/- 13.6 pCi/L
				Radium-226	13,510 +/- 2,655 pCi/L
				Radium-228	929 +/- 179 pCi/L
				Thorium-228	45.0 +/- 8.41 pCi/L
				Thorium-230	2.80 +/- 1.44 pCi/L
				Thorium-232	-0.147 +/- 0.645 pCi/L
				Uranium-234	1.91 +/- 1.82 pCi/L
				Uranium-235	0.337 +/- 0.962 pCi/L
				Uranium-238	0.765 +/- 1.07 pCi/L
Maxwell 1C	31-101-22963-03-01	4/1/2009	Caton (Steuben)	Gross Alpha	3,968 +/- 1,102 pCi/L
				Gross Beta	618 +/- 599 pCi/L
				Cesium-137	-0.443 +/- 3.61 pCi/L
				Cobalt-60	-1.840 +/- 2.81 pCi/L
				Ruthenium-106	17.1 +/- 29.4 pCi/L
				Zirconium-95	26.4 +/- 8.38 pCi/L
				Radium-226	7,885 +/- 1,568 pCi/L
				Radium-228	234 +/- 50.5 pCi/L
				Thorium-228	147 +/- 23.2 pCi/L
				Thorium-230	1.37 +/- 0.918 pCi/L
				Thorium-232	0.305 +/- 0.425 pCi/L
				Uranium-234	1.40 +/- 1.25 pCi/L
				Uranium-235	0.254 +/- 0.499 pCi/L
				Uranium-238	0.508 +/- 0.708 pCi/L
Haines 1	31-101-14872-00-00	4/1/2009	Avoca (Steuben)	Gross Alpha	54.6 +/- 37.4 pCi/L
				Gross Beta	59.3 +/- 58.4 pCi/L
				Cesium-137	0.476 +/- 2.19 pCi/L
				Cobalt-60	-0.166 +/- 2.28 pCi/L
				Ruthenium-106	7.15 +/- 19.8 pCi/L
				Zirconium-95	0.982 +/- 4.32 pCi/L
				Radium-226	0.195 +/- 0.162 pCi/L
				Radium-228	0.428 +/- 0.335 pCi/L
				Thorium-228	0.051 +/- 0.036 pCi/L
				Thorium-230	0.028 +/- 0.019 pCi/L
				Thorium-232	0.000 +/- 0.007 pCi/L
				Uranium-234	0.000 +/- 0.014 pCi/L
				Uranium-235	0.000 +/- 0.005 pCi/L
				Uranium-238	-0.007 +/- 0.006 pCi/L

Well	API #	Date Collected	Town (County)	Parameter	Result +/- Uncertainty
Haines 2	31-101-16167-00-00	4/1/2009	Avoca (Steuben)	Gross Alpha	70.0 +/- 47.8 pCi/L
				Gross Beta	6.79 +/- 54.4 pCi/L
				Cesium-137	2.21 +/- 1.64 pCi/L
				Cobalt-60	1.42 +/- 2.83 pCi/L
				Ruthenium-106	5.77 +/- 15.2 pCi/L
				Zirconium-95	2.43 +/- 3.25 pCi/L
				Radium-226	0.163 +/- 0.198 pCi/L
				Radium-228	0.0286 +/- 0.220 pCi/L
				Thorium-228	0.048 +/- 0.038 pCi/L
				Thorium-230	0.040 +/- 0.022 pCi/L
				Thorium-232	-0.006 +/- 0.011 pCi/L
				Uranium-234	0.006 +/- 0.019 pCi/L
				Uranium-235	0.006 +/- 0.013 pCi/L
				Uranium-238	-0.013 +/- 0.009 pCi/L
Carpenter 1	31-101-26014-00-00	4/1/2009	Troupsburg (Steuben)	Gross Alpha	7,974 +/- 1,800 pCi/L
				Gross Beta	1,627 +/- 736 pCi/L
				Cesium-137	2.26 +/- 4.97 pCi/L
				Cobalt-60	-0.500 +/- 3.84 pCi/L
				Ruthenium-106	49.3 +/- 38.1 pCi/L
				Zirconium-95	30.4 +/- 11.0 pCi/L
				Radium-226	5,352 +/- 1,051 pCi/L
				Radium-228	138 +/- 37.3 pCi/L
				Thorium-228	94.1 +/- 14.9 pCi/L
				Thorium-230	1.80 +/- 0.946 pCi/L
				Thorium-232	0.240 +/- 0.472 pCi/L
				Uranium-234	0.000 +/- 0.005 pCi/L
				Uranium-235	0.000 +/- 0.005 pCi/L
				Uranium-238	-0.184 +/- 0.257 pCi/L
Zinck 1	31-101-26015-00-00	4/1/2009	Woodhull (Steuben)	Gross Alpha	9,426 +/- 2,065 pCi/L
				Gross Beta	2,780 +/- 879 pCi/L
				Cesium-137	5.47 +/- 5.66 pCi/L
				Cobalt-60	0.547 +/- 4.40 pCi/L
				Ruthenium-106	-16.600 +/- 42.8 pCi/L
				Zirconium-95	48.0 +/- 15.1 pCi/L
				Radium-226	4,049 +/- 807 pCi/L
				Radium-228	826 +/- 160 pCi/L
				Thorium-228	89.1 +/- 14.7 pCi/L
				Thorium-230	0.880 +/- 1.23 pCi/L
				Thorium-232	0.000 +/- 0.705 pCi/L
				Uranium-234	-0.813 +/- 0.881 pCi/L
				Uranium-235	-0.325 +/- 0.323 pCi/L
				Uranium-238	-0.488 +/- 0.816 pCi/L

Well	API #	Date Collected	Town (County)	Parameter	Result +/- Uncertainty
Schiavone 2	31-097-23226-00-01	4/6/2009	Reading (Schuyler)	Gross Alpha	16,550 +/- 3,355 pCi/L
				Gross Beta	1,323 +/- 711 pCi/L
				Cesium-137	1.46 +/- 5.67 pCi/L
				Cobalt-60	-2.550 +/- 5.11 pCi/L
				Ruthenium-106	20.6 +/- 42.7 pCi/L
				Zirconium-95	30.6 +/- 12.1 pCi/L
				Radium-226	15,140 +/- 2,989 pCi/L
				Radium-228	957 +/- 181 pCi/L
				Thorium-228	38.7 +/- 7.45 pCi/L
				Thorium-230	1.68 +/- 1.19 pCi/L
				Thorium-232	0.153 +/- 0.301 pCi/L
				Uranium-234	3.82 +/- 2.48 pCi/L
				Uranium-235	0.354 +/- 0.779 pCi/L
				Uranium-238	0.354 +/- 0.923 pCi/L
Parker 1	31-017-26117-00-00	4/2/2009	Oxford (Chenango)	Gross Alpha	3,914 +/- 813 pCi/L
				Gross Beta	715 +/- 202 pCi/L
				Cesium-137	4.12 +/- 3.29 pCi/L
				Cobalt-60	-1.320 +/- 2.80 pCi/L
				Ruthenium-106	-9.520 +/- 24.5 pCi/L
				Zirconium-95	1.39 +/- 6.35 pCi/L
				Radium-226	1,779 +/- 343 pCi/L
				Radium-228	201 +/- 38.9 pCi/L
				Thorium-228	15.4 +/- 3.75 pCi/L
				Thorium-230	1.25 +/- 0.835 pCi/L
				Thorium-232	0.000 +/- 0.385 pCi/L
				Uranium-234	1.82 +/- 1.58 pCi/L
				Uranium-235	0.304 +/- 0.732 pCi/L
				Uranium-238	0.304 +/- 0.732 pCi/L
WGI 10	31-097-23930-00-00	4/6/2009	Dix (Schuyler)	Gross Alpha	10,970 +/- 2,363 pCi/L
				Gross Beta	1,170 +/- 701 pCi/L
				Cesium-137	1.27 +/- 5.17 pCi/L
				Cobalt-60	0.960 +/- 4.49 pCi/L
				Ruthenium-106	14.5 +/- 37.5 pCi/L
				Zirconium-95	15.2 +/- 8.66 pCi/L
				Radium-226	6,125 +/- 1,225 pCi/L
				Radium-228	516 +/- 99.1 pCi/L
				Thorium-228	130 +/- 20.4 pCi/L
				Thorium-230	2.63 +/- 1.39 pCi/L
				Thorium-232	0.444 +/- 0.213 pCi/L
				Uranium-234	0.000 +/- 0.702 pCi/L
				Uranium-235	1.17 +/- 1.39 pCi/L
				Uranium-238	0.389 +/- 1.01 pCi/L

Well	API #	Date Collected	Town (County)	Parameter	Result +/- Uncertainty
WGI 11	31-097-23949-00-00	4/6/2009	Dix (Schuyler)	Gross Alpha	20,750 +/- 4,117 pCi/L
				Gross Beta	2,389 +/- 861 pCi/L
				Cesium-137	4.78 +/- 6.95 pCi/L
				Cobalt-60	-0.919 +/- 5.79 pCi/L
				Ruthenium-106	-19.700 +/- 49.8 pCi/L
				Zirconium-95	9.53 +/- 11.8 pCi/L
				Radium-226	10,160 +/- 2,026 pCi/L
				Radium-228	1,252 +/- 237 pCi/L
				Thorium-228	47.5 +/- 8.64 pCi/L
				Thorium-230	1.55 +/- 1.16 pCi/L
				Thorium-232	-0.141 +/- 0.278 pCi/L
				Uranium-234	0.493 +/- 0.874 pCi/L
				Uranium-235	0.000 +/- 0.540 pCi/L
				Uranium-238	-0.123 +/- 0.172 pCi/L

New York State

DEC

Division of Mineral Resources

Appendix 14

Department of Public Service
Environmental Management & Construction
Standards and Practices - Pipelines

Draft Supplemental Generic Environmental Impact Statement

ENVIRONMENTAL MANAGEMENT AND CONSTRUCTION

STANDARDS AND PRACTICES

CHECK-OFF LIST: PART III

PIPELINE

III. General Planning Objectives and Procedures	3	
1. Planning Objectives	3	
1.1 Supervision and Inspection	5	
1.1.1 Environmental Inspection	5	
1.1.2 Responsibilities of Environmental Inspector	5	
2. Procedures for the Identification and Protection of Sensitive Resources	6	
2.1 Rare and Endangered Species & Their Habitats	7	
2.2 Cultural Resources	8	
2.3 Streams, Wetlands & Other Water Resources	9	
2.4 Active Agricultural Lands	9	
2.5 Alternative/Conflicting Land Uses	10	
2.6 Steep Slopes, Highly Erodible Soils & Flood Plains	10	
2.7 Timber Resources, Commercial Sugarbushes & Unique/Old Growth Forests	11	
2.8 Officially Designated Visual Resources	11	
3. Land Requirements	12	
3.1 Objectives	12	
3.2 Pipeline Routing	12	
3.3 Right-Of-Way Width	13	
3.3.1 Permanent ROW	13	
3.3.2 Temporary ROW	13	
3.3.3 Extra Work Space	13	
3.3.4 Associated/Appurtenant Facilities: Meter Site	14	
3.3.5 Compressor Stations	15	
3.3.6 Storage, Fabrication and other Construction Related Sites	15	
3.3.7 Permanent Disposal Sites	16	
4. Site Preparation	16	
4.1 Objectives	16	
4.2 Staking and ROW Delineation	17	
5. Clearing in Upland Areas	17	
5.1 Objectives	17	
5.2 Definitions	18	
5.3 Equipment	18	

5.4 Clearing Methods & Procedures in Upland Areas	19	
5.5 Log Disposal	20	
5.5.1 Construction Use	20	
5.5.2 Log Piles	20	
5.5.3 Sale	21	
5.5.4 Chipping	21	
5.6 Slash and Stump Disposal	21	
5.6.1 Stacking and Scattering	21	
5.6.2 Chipping	22	
5.6.3 Burning	22	
5.6.4 Hauling	22	
5.6.5 Burial	23	
5.7 Vegetation Buffer Areas	23	
5.8 Walls and Fences	24	
5.8.1 Stone Walls	24	
5.8.2 Fences	24	
6. Grading in Upland Locations	25	
6.1 Objectives	25	
6.2 Techniques and Equipment	25	
6.3 Topsoil Stripping and Segregation	26	
6.3.1 No Stripping	26	
6.3.2 Ditchline	27	
6.3.3 Ditch and Spoil	27	
6.3.4 Full Width	27	
6.4 Access Road & Construction Paths	28	
6.4.1 Objectives	28	
6.4.2 Construction Paths	28	
6.4.3 Off ROW Access Roads	29	
7. Erosion and Sedimentation Control	29	
7.1 Objectives	29	
7.2 Measures and Devices	30	
7.2.1 Hay Bales and Silt Fence	30	
7.2.2 Water Diversion Devices	31	
7.2.2.1 Waterbars	31	
7.2.2.2 Swales and Berms	32	
7.2.2.3 Side Ditches	32	
7.2.2.4 French Drains	32	
7.2.2.5 Culverts	33	
7.2.2.6 Sediment Retention Ponds and Filtration Devices	33	
7.2.2.7 Catchment Basins	33	
7.2.2.8 Mulch and Other Soil Stabilizers	34	
7.2.2.9 Driveable Berms	34	
7.3 Fugitive Dust Emissions	34	

8. Trenching	34	
8.1 Objectives	34	
8.2 Trenching Equipment	35	
8.3 Ditch Width and Cover Requirements	35	
8.4 Length of Open Trench	36	
8.5 Ditch Plugs	36	
8.6 Blasting	37	
8.6.1 Preconstruction Studies	37	
8.6.2 Monitoring and Inspection	38	
8.6.3 Time Constraints and Notification	38	
8.6.4 Remediation	38	
9. Pipelaying	39	
9.1 Objectives	39	
9.2 Stringing	39	
9.3 Fabrication	40	
9.4 Trench Dewatering	40	
9.5 Lowering In	41	
9.6 Trench Breakers	41	
9.7 Padding	41	
9.8 Backfilling	41	
10. Waterbody Crossings	42	
10.1 Objectives	42	
10.2 Definition	42	
10.2.1 Categories and Classifications	43	
10.3 Spill Prevention	44	
10.4 Buffer Areas	45	
10.5 Installation	45	
10.5.1 Equipment Crossings	45	
10.5.2 Concrete Coating	46	
10.6 Dry Crossing Methods	47	
10.6.1 Trenching	47	
10.6.2 Lowering-in / Pipe Placement	48	
10.6.3 Trench Backfill	48	
10.6.4 Cleanup and Restoration	48	
10.7 Dry Stream Crossing Techniques	49	
10.7.1 Bores and Pipe Push	49	
10.7.2 Directional Drilling	49	
10.7.3 Other Dry Crossing Methods	50	
10.7.3.1 Flume Method	50	
10.7.3.2 Dam and Pump Method	51	
11. Wetland Crossings		

11.1 Objectives	52	
11.2 Regulatory Agencies and Requirements	53	
11.3 Wetland Identification and Delineation	53	
11.4 Timing and Scheduling Constraints	54	
11.5 Clearing Methods	54	
11.6 Construction Path and Access Road Construction	55	
11.6.1 No Road or Pathway	55	
11.6.2 Bridges and Flotation Devices	56	
11.6.3 Timber Mats	56	
11.6.4 Log Rip Rap (Corduroy) Roads	56	
11.6.5 Filter Fabric and Stone Roads	57	
11.7 Grading	58	
11.8 Trenching	58	
11.8.1 Standard Trenching	58	
11.8.2 Trenching from Timber Mats	59	
11.8.3 One Pass In-line Trenching	59	
11.8.4 Modified One Pass In-Line	59	
11.9 Directional Drill and Conventional Bore	59	
11.10 Spoil Placement and Control	60	
11.10.1 Topsoil Stripping	60	
11.11 Ditch Plugs in Wetlands	61	
11.12 Pipe Fabrication and Use	61	
11.12.1 Concrete Coated Pipe	61	
11.12.2 Fabrication	61	
11.13 Trench Dewatering	62	
11.14 Backfill	62	
11.15 Cleanup and Restoration	63	
11.15.1 Restoration	63	
11.15.2 Cleanup	63	
12. Agricultural Lands	63	
12.1 Objectives	64	
12.2 Types of Agricultural Lands/mowed meadow	64	
12.3 Clearing	65	
12.4 Grading and Topsoil Segregation	65	
12.4.1 Grading	65	
12.4.2 Topsoiling	65	
12.4.2.1 Cropland	65	
12.4.2.2 Pasture/Grazing/mowed meadow	66	
12.5 Drain Tiles	66	
12.6 Trenching	67	
12.7 Backfilling	67	
12.8 Cleanup and Restoration	68	
12.9 Revegetation	68	
12.9.1 Seed Mixtures	68	

12.9.2 Timing	69	
12.9.3 Mulching	69	
12.9.4 Temporary Diversion Berms	69	
12.10 Remediation and Monitoring	69	
13. Testing	70	
14. General Cleanup and Restoration	71	
14.1 Objectives	71	
14.2 Cleanup	71	
14.3 Restoration	73	
14.3.1 Wooded and non-agricultural Uplands	73	
14.3.1.1 Grading	73	
14.3.1.2 Lime Application	74	
14.3.1.3 Fertilizing	74	
14.3.1.4 Discing and Raking	75	
14.3.1.5 Seeding and Planting	75	
14.3.2 Restoration – Urban Residential	77	
15. Noise Impact Mitigation	77	
15.1 Objectives	77	
15.2 Noise Sensitive Receptors	78	
15.3 Remediation and Control	78	
15.3.1 Noise Control Measures for Equipment And Linear Construction	78	
15.3.2 Noise Control Measures for Point Source Noise Producers	79	
15.4 Compressor Stations	80	
16. Transportation and Utility Crossings	80	
16.1 Objectives	80	
16.2 Road and Highway Crossings	81	
16.2.1 Permitting	81	
16.2.2 Preconstruction Planning	81	
16.2.3 Road Crossing Methods	82	
16.2.3.1 Trenched Open-Cut	82	
16.2.3.2 Trenchless, Bore/Direct Drill	83	
16.2.4 Longitudinal In-Road Construction	83	
16.2.5 Signs	84	
16.2.6 Repairs and Restoration	85	
16.3 Canal Crossings	85	
16.3.1 Scheduling	85	
16.3.2 Construction	86	
16.3.3 Restoration	86	
16.4 Railroad Crossings	86	
16.5 Utility Crossings	87	
16.5.1 Overhead Electric Facilities	87	

16.5.1.1 Perpendicular Crossings	87	
16.5.1.2 Linear ROW Co-occupation	88	
16.5.2 Underground Utility Crossings	90	
17. Hazardous Materials	90	
17.1 Objectives	90	
17.2 Regulatory Concerns	90	
17.3 Spill Control Equipment	93	
17.3.1 Upland	93	
17.3.2 Waterborne Equipment	94	
17.4 Storage and Handling	94	
17.4.1 Storage	94	
17.4.2 Equipment Refueling	95	
17.5 Spill Response Procedures	96	
17.6 Excavation and Disposal	96	
17.7 Hazardous Waste Contact	96	
18. Pipeline Operation, ROW Management & Maintenance	97	
18.1 Objectives	97	
18.2 ROW Maintenance	97	
18.3 Inspection	98	
18.4 Vegetation Maintenance	98	
18.4.1 Mechanical Treatment	99	
18.4.2 Chemical Treatment	99	
18.4.2.1 Stem Specific Treatments	99	
18.4.2.1.1 Basal Treatments	99	
18.4.2.1.2 Stem Injection	100	
18.4.2.1.3 Cut and Treat	100	
18.4.2.2 Non Stem-specific Applications	100	
19. Communications and Compliance	101	
19.1 Communication with Staff and the Commission	101	
19.1.1 Pre-filing Contact	101	
19.1.2 Post-filing Contact	101	
19.1.3 Post Certification Contact	101	
19.2 Compliance with Commission Orders	101	