

Department of Environmental Conservation

Division of Mineral Resources

New York State
Oil, Gas
and
Mineral Resources
2000

Annual Report

New York State Department of Environmental Conservation

George E. Pataki, *Governor*

Erin M. Crotty, *Commissioner*

Division Mission Statement

The Division of Mineral Resources is responsible for ensuring the environmentally sound, economic development of New York's non-renewable energy and mineral resources for the benefit of current and future generations.

This report was produced by the
NYS Department of Environmental Conservation

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Bradley J. Field, Director

New York State
Oil, Gas
and
Mineral Resources

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DIRECTOR'S COLUMN

by **Bradley Field**

The year 2000 was a watershed year, both for New York's mineral resource industries and this Division's regulatory programs. Development of the natural gas resources in the Trenton-Black River formations attracted national attention and was a major success story. The deep discoveries also sparked renewed interest in natural gas resources on State lands. In mined land reclamation, significant staff additions in 2000 allowed us to perform more inspections and check on mines that had not been inspected for several years. The staff increase also allowed more timely permit reviews and enhanced regulatory compliance efforts.

Trenton-Black River activity has been concentrated in the Finger Lakes region where ten new gas fields were discovered between 1995 and 2000. Steuben County, with just 33 active wells, moved up to the number two gas producing county in the State. Based on leasing activity and information requests from landowners and local governments, we expect that Trenton-Black River exploration will expand into other parts of the State.

Since 40-acre statewide spacing is too small for deep wells, significant staff time has been invested in establishing proper spacing for the Trenton-Black River discoveries. The well spacing and compulsory integration process requires extensive staff preparation and a public hearing to protect the interests of mineral rights owners.

Be sure to read the new expanded mined land reclamation section which starts on page 22. The regional highlights show the diversity of issues facing the mining industry as well as provide information on program successes. We are particularly proud of the two mines that won reclamation awards in 2000. Department staff also reclaimed an abandoned mine in Washington County and the Town of Huntington reclaimed a mine that was once the largest sand pit in the entire State. It is now an attractive golf course serving the surrounding community.

The mining industry appears to be going through a period of change. While the total number of mined land permits issued in 2000 remained within the normal range, permits for new mines dropped by 45 percent between 1995 and 2000. Given the difficulty of siting mines in new areas, it is likely more attention will be focused in the future on the option of expanding and/or deepening existing mines.

Our website continues to be an invaluable tool for providing information to industry, landowners and the public. I encourage you to visit the site often for the latest developments in both programs. You will also find information on wells and mines in your area and educational information of general interest.

The future looks exciting. The Trenton-Black River gas play could not have come at a better time as New York and the nation focus on the location, generation, deliverability and security of our energy supplies. Mining of sand and gravel and other minerals will continue to pose interesting regulatory challenges. The need for raw materials and infrastructure to serve a growing economy must be met at a time when population centers are expanding into areas of open space and mineral reserves. While mineral resource debates are often framed by uncertainty, our goal in the Division of Mineral Resources is to provide a predictable, consistent and fair regulatory program.



EXECUTIVE SUMMARY

Mining occurs in every region of the State except the New York City area. Oil and gas development has historically occurred in the western half of the State, but activity in the Finger Lakes area increased significantly in 2000. Due to differences in legal reporting requirements, the categories of statistics presented for the two programs are not identical. All information is for the year 2000.

Oil, Gas and Solution Mining

Inspections - Staff traveled 109,087 miles and performed 2,972 oil and gas inspections.

Permits and Completions

Gas Permits	78	Gas Comp.	112
Oil Permits	42	Oil Comp.	17
Other Permits	27	Other Comp.	30

Active Wells - NY had roughly 10,000 active wells in 2000 and tens of thousands of older wells (plugged, unplugged, status unknown).

Production & Market Value - Average oil and gas prices were up roughly 70% and the total market value of production was \$71.54 million, the highest since 1987.

Gas	17.7 bcf	Up	5.4%
Oil	180,590 bbl	Down	6.4%

Financial Security - New York held \$11.3 million in 2000 to guarantee well plugging and final site reclamation.

State Leasing - 85 leases were in effect covering 61,684 acres and 184 productive wells.

Revenues from Oil and Gas

State Revenues	\$354,751
Local Govt. Taxes	\$2.14 million
Landowner Royalties	\$8.94 million

Underground Natural Gas Storage - 22 facilities were 76% full at year-end.

Total Storage Capacity	147.313 bcf
Working Gas Capacity	92.813 bcf
Max. Daily Deliverability	1.427 bcf/day

Solution Mining - Five facilities produced 2.2 billion gallons of brine equal to 2.5 million metric tons of salt.

Mined Land Reclamation

Inspections - Staff traveled 140,000 miles for 1,554 mine inspections. The addition of more field staff significantly increased the number of violations detected.

Permits

New	71
Renewal	290
Total	361

Active Mines 2,475

Affected Acres 48,863

Reclaimed Acres

In 2000	287
Since 1975	17,987

Financial Security - New York held \$ 77.1 million in 2000 to guarantee mine reclamation.

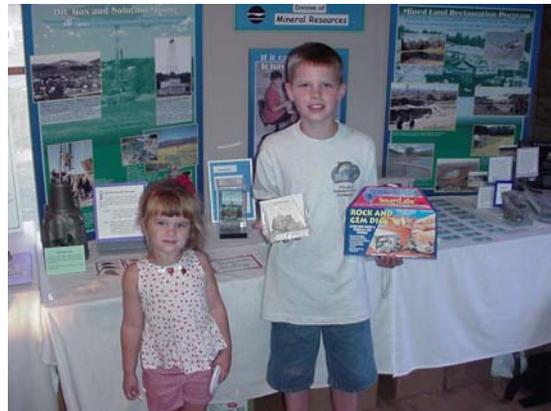


Photo 1. The Division set up an exhibit at the State Fair for the first time in 2000. We provided information, interactive games, mineral displays and a raffle. Here's a happy winner.

New York State
 Department of Environmental Conservation
Division Of Mineral Resources
 Regional Service Areas

● Avon Office (Regions 6,7,8)
 6274 E. Avon-Lima Rd.
 Avon, NY 14414
 Ph: (585) 226-5371
 Fax: (585) 226-9034

◆ Allegany Office (Region 9)
 182 E Union St.
 Allegany, NY 14706-1328
 Ph: (716) 372-0645
 Fax: (716) 372-2113

■ Mined Land Reclamation Offices

★ Central Office
 (Regions 1 - 5)
 625 Broadway, Third Floor
 Albany, NY 12233-6500
 Ph: (518) 402-8056
 Fax: (518) 402-8060

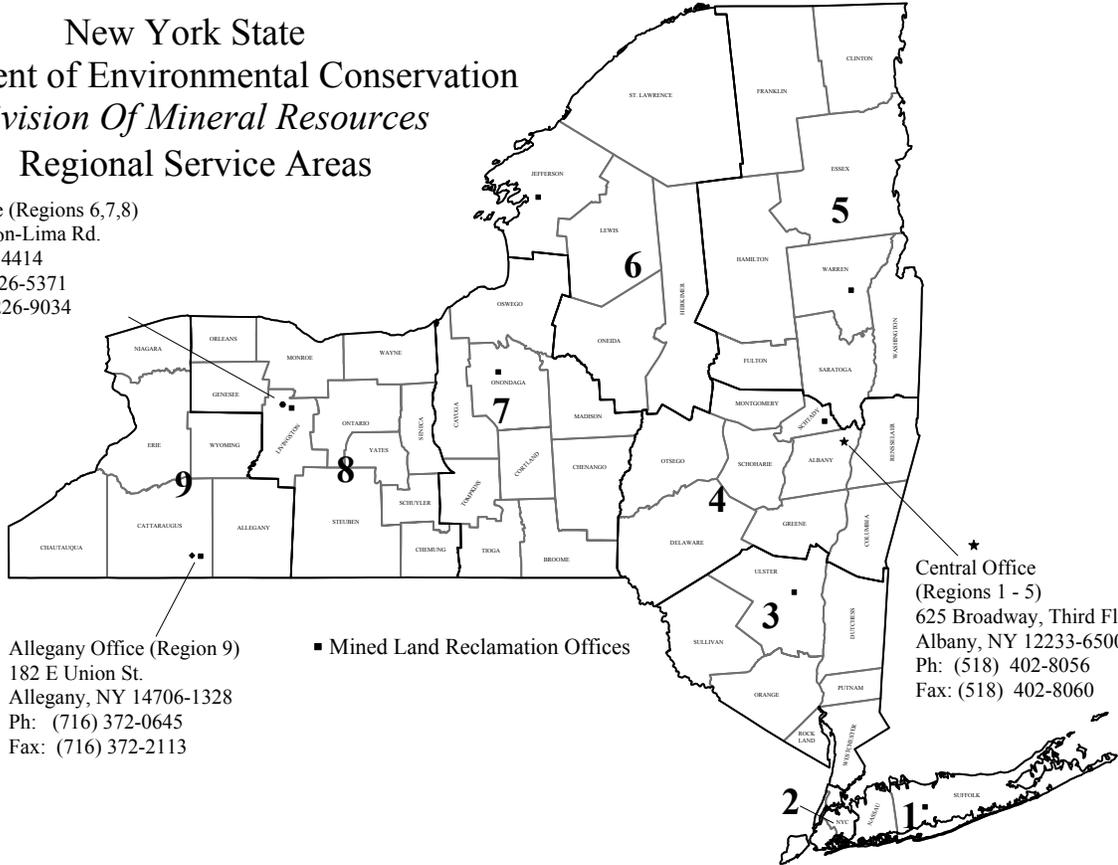


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New York State Oil, Gas and Mineral Resources, 2000

PERMITS & COMPLETIONS

Drilling Permits

Division staff issued 147 drilling permits in 2000: 78 gas well permits, 42 oil permits, 5 stratigraphic permits, 16 brine permits and 6 geothermal permits. The top 3 counties for drilling permits were Steuben, Chautauqua and Cattaraugus. For a more complete county breakdown on drilling permits, see Table 1 on page 2.

Of the 78 permits issued for gas wells during the year, 36 or approximately 46 percent targeted the Trenton-Black River formations.

More complete information on permits, including the town, owner, API number, well name, issue date and spud date, starts on page 26.

Wildcats and field extensions drilled in 2000 are shown in Table 2 on page 4.

Well Completions

Wells were completed in twelve counties: Allegany, Broome, Cattaraugus, Chautauqua, Chemung, Erie, Genesee, Onondaga, Schuyler, Steuben, Wyoming and Yates. The top three counties were Chautauqua, Cattaraugus and Steuben. Trenton-Black River completions accounted for about a third of the wells.

The location of all wells completed in 2000 is shown on Map 2 on page 3. For more details on these wells see the table on page 32.

Chart 1 below gives a ten-year comparison of drilling permits versus well completions.



For Well Codes used in Tables - See page 26

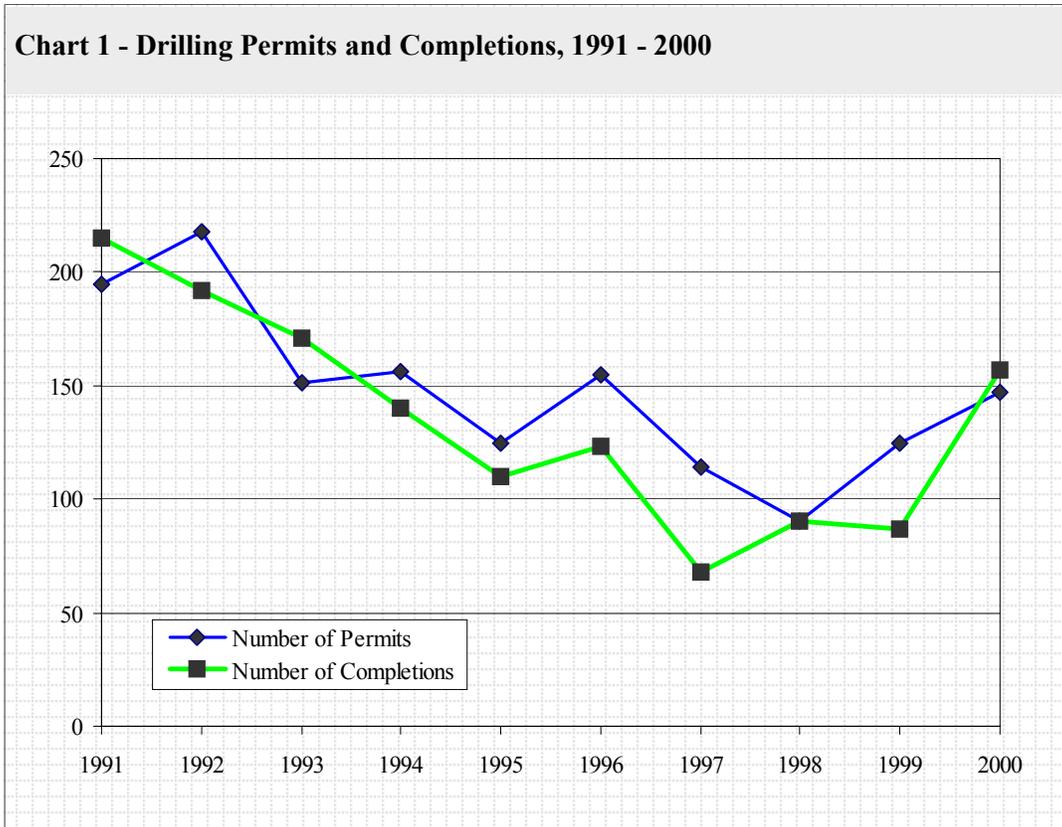


Table 1

Permitted Well Types, 2000

County	Gas Well	Oil Well	Brine Well	Strati-graphic	Geo-thermal	Total
Allegany		6				6
Broome	2					2
Cattaraugus	4	15				19
Cayuga	8					8
Chautauqua	16	6				22
Chemung	10					10
Erie	5					5
Genesee	3					3
NY City					6	6
Schuyler	5		2			7
Seneca	4					4
Steuben	13	15		2		30
Tioga				3		3
Wyoming	1		14			15
Yates	7					7
Total	78	42	16	5	6	147



Photo 2. Rig crew making a drill pipe connection.

Work on a drilling rig is dangerous, technically-specialized and physically demanding.

In 2000, there was a nationwide shortage of both drilling rigs and the crews to run them. This was due to the increased level of drilling activity spurred by high natural gas and oil prices.

Map 2 - Formations Completed 2000

- ▼ Gas - Trenton-Black River
- ▲ Gas - Medina/Queenston/Oriskany
- Confidential
- Oil
- Salt
- ✦ Plugged & Abandoned

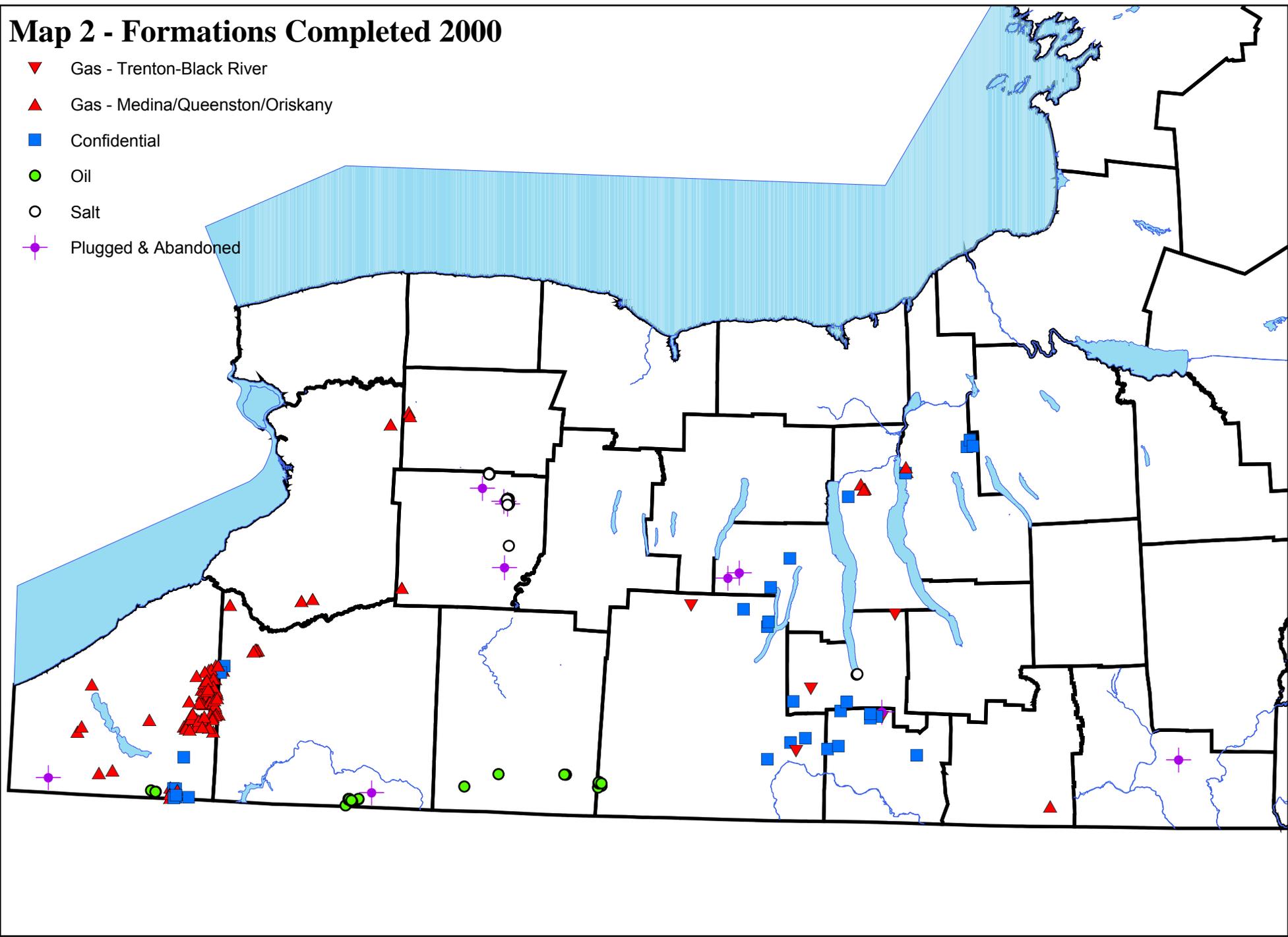


Table 2 - Drilled Wildcats and Field Extensions, 2000

County/ Town	Company	Well Name & API #	Depth	Date	Well Type/Field
Broome/ Colesville	Cabot Oil & Gas Corp.	Wicks 2 31007228550000	4,525	12/17/00	DW/ Dry Wildcat
Cayuga/ Sennett	Columbia Nat. Resources	McMahon 624439 31011228730000	2,420	12/21/00	GE/ Auburn
Chemung/ Big Flats	Penn. General Energy	Lovell 1323 31015228310000	9,824	7/4/00	GWL/ Quackenbush
Chemung/ Catlin	Fairman Drilling Co.	Whiteman 1 31015228390000	9,511	6/29/00	GWL/ County Line
Chemung/ Erin	Columbia Nat. Resources	Monahan 624115 31015228380000	10,380	8/27/00	GWL/ Langdon Hill
Chemung/ Veteran	Fairman Drilling Co.	Broz Unit 1 31015228260000	9,362	3/2/00	GW/Terry Hill South
Chemung/ Veteran	Fairman Drilling Co.	Bennett Family 1 31015228270000	9,455	5/15/00	DW/ Unnamed
Chemung/ Veteran	Fairman Drilling Co.	Kimball 1 31015228570000	9,166	10/1/00	GE/ Terry Hill South
Erie/ Collins	US Energy Development	Gominiak Unit #1 3102923380000	3,095	2/18/00	GE/ North Collins
Schuyler/ Orange	Columbia Nat. Resources	Grand Prix 624066 31097228300000	9,745	10/21/00	GW/ Sexton Hollow
Schuyler/ Orange	East Resources, Inc.	SRA 2 #1 31097228410000	8,770	8/19/00	GWL/ Sugar Hill
Steuben/ Cohocton	Columbia Nat. Resources	S&D Farms 624066 31101227590100	8147	5/29/00	GE/ Pine Hill
Steuben/ Cohocton	Columbia Nat. Resources	Peck 1 (623516) 31101227590200	7,644	5/12/00	GEL/ Pine Hill
Steuben/ Erwin	Fairman Drilling Co.	NYS GMA 2 31101228610000	10,526	12/7/00	DW/ Dry Wildcat
Steuben/ Hornby	Penn. General Energy	Howe 1300-A 31101228140100	10,060	5/25/00	GE/ Wilson Hollow
Steuben/ Hornby	Penn. General Energy	Rice 1301 31101228250000	9,818	9/2/00	GE/ Wilson Hollow
Steuben/ Hornby	Penn. General Energy	Van Vleet 1355 31101228250000	10,458	10/14/00	GE/ Wilson Hollow
Steuben/ Wayland	Belden & Blake Corp.	Huber 1 31101228590000	7,526	11/17/00	DW/ Unnamed
Steuben/ Wayland	Belden & Blake Corp.	Huber 1-A 31101228590100	7,526	11/17/00	DW/ Unnamed
Yates/ Barrington	Columbia Nat. Resources	Bauer 623781-A 31123227910100	6,860	3/4/00	DW/ Dry Wildcat
Yates/ Barrington	Columbia Nat. Resources	Zimmerman 623825A 31123227960100	7,572	2/13/00	DW/ Dry Wildcat
Yates/ Benton	Columbia Nat. Resources	Martin 623864 31123228280000	6,652	11/5/00	GW/ Unnamed
Yates/ Italy	Belden & Blake Corp.	Costanza 1 31123227640000	6,473	4/8/00	DW/ Dry Wildcat
Yates/ Italy	Belden & Blake Corp.	Costanza 1-A 31123227640100	6,574	4/8/00	DW/ Dry Wildcat
Yates/ Italy	Belden & Blake Corp.	Costanza 1-B 31123227640200	6,141	4/23/00	DW/ Dry Wildcat
Yates/ Italy	Belden & Blake Corp.	Watson 1 31123228500000	7,136	9/27/00	DW/ Dry Wildcat
Yates/ Italy	Belden & Blake Corp.	Watson 1-A 31123228500100	6,877	10/17/00	DW/ Dry Wildcat
Yates/ Jerusalem	Columbia Nat. Resources	Dick 623970 31123228400000	6,695	6/11/00	DWL/ Dry Wildcat

PRODUCTION OF OIL & GAS

New York's reported natural gas production increased to 17.7 billion cubic feet (bcf), a 5.4 percent increase from 1999. Over five bcf of gas came from just 20 producing Trenton-Black River wells, for an average per-well production of 270 million cubic feet (mmcf).

Chautauqua County led in natural gas production, followed by Steuben County. Steuben County's production more than doubled from the prior year as a result of gas production from 19 Trenton-Black River wells.

In 2000, New York's production of oil decreased to 180,590 barrels (bbl), a drop of 6.4 percent from the prior year, despite the significant rise in oil prices in 2000.

Table 3 lists the top ten gas producing counties, while Table 4 gives the top ten gas and oil producing companies, respectively. Map 3 on page 8 shows natural gas production by town, and Map 4 shows oil production. Chart 2 on page 6 shows the State's total oil and gas production

for the past ten years. Well counts and gas production volumes are based on reports submitted by well owners. For an explanation of the units of volume measurement, see the box on page 7.

Table 3

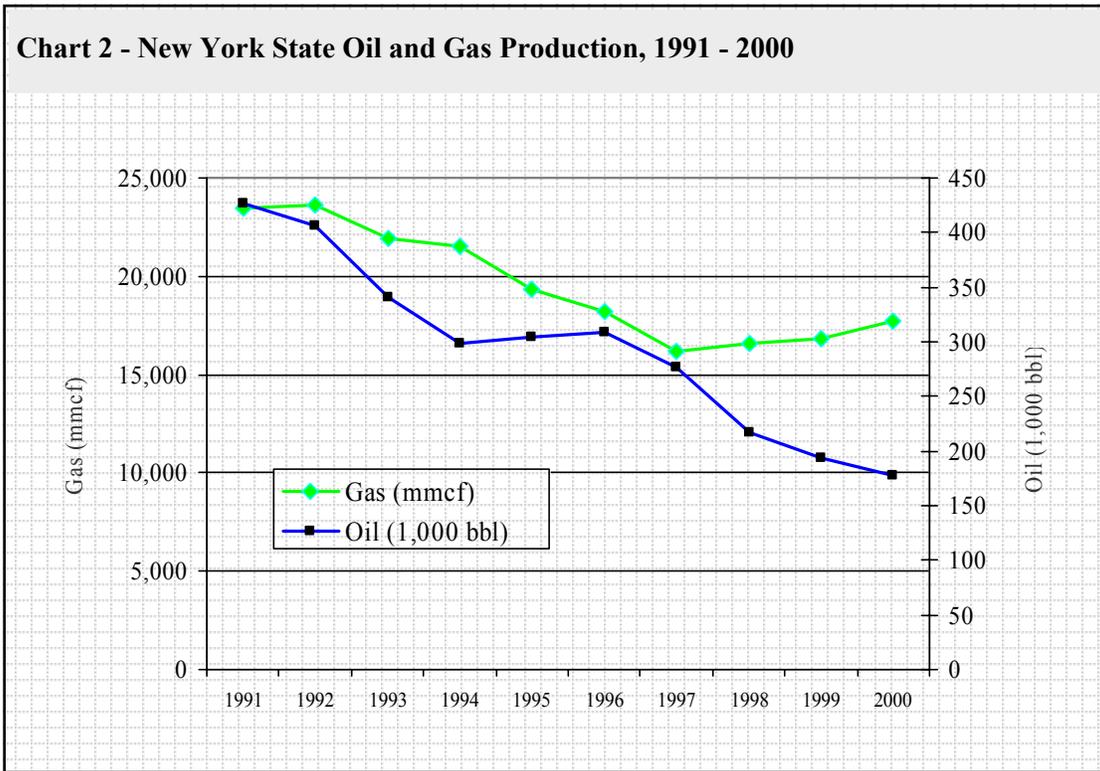
Top Ten Gas Producing Counties, 2000

County	Gas (mcf)	Active Wells	Average mcf/Well
Chautauqua	5,966,762	2,984	2,000
Steuben	5,234,695	33	158,627
Cattaraugus	1,256,416	547	2,297
Erie	1,220,465	818	1,492
Cayuga	1,057,443	306	3,456
Genesee	797,943	435	1,834
Seneca	637,314	142	4,488
Tioga	437,535	12	36,461
Wyoming	378,875	238	1,592
Allegany	303,109	45	6,736

Table 4

Top Ten Gas and Oil Producing Companies, 2000

Company	Gas (mcf)	Company	Oil (bbl)
Columbia Natural Resources	4,867,226	Richardson Petroleum Corp.	19,555
Belden & Blake Corporation	2,044,792	Quail Energy Corp.	16,035
Pennsylvania General Energy	1,692,663	East Resources, Inc.	14,948
Great Lakes Energy Partners	1,688,707	Synergy Oil & Gas, Inc.	12,129
Seneca Resources Corp.	758,741	BDH Oil, Inc.	11,773
United States Gypsum Co.	673,119	Woods Oil Company, Inc.	9,330
Nornew, Inc.	651,891	REI-NY	5,763
Lenape Resources, Inc.	481,601	Otis Eastern Service, Inc.	4,896
Stedman Energy, Inc.	419,432	A. J. Lease Account	4,867
Kastle Resources Enterprises	286,050	Klein, Roger, A.	4,615



Natural Gas

Natural gas is an important energy source for New York homeowners. Based on 1997 data, 3.4 million households use natural gas for home heat, cooking, heating water or other uses. For gas-fired heat, the average usage in New York is 79 mcf per year¹. That means the State's 2000 natural gas production of 17.7 bcf was enough to heat roughly 220,000 homes.

Crude Oil

The first commercial oil well was drilled in New York in 1865. New York's crude oil is particularly high in paraffin, and is refined into many valuable end products.

¹ US DOE/EIA 1997 Residential Energy Consumption Survey

Landowner Wells

A significant percentage of New York's gas well owners have just one or two wells. These wells, known as "landowner wells", are usually no longer productive enough for commercial purposes, but may produce enough gas to heat a house. The Division has prepared a brochure entitled "Do You Own or Intend to Buy a Natural Gas or Oil Well: Tips for Landowners". The brochure includes information on:

- how to identify an old well on land you own or might buy,
- your legal responsibilities when you own an unplugged well, and
- safety tips concerning gas hookups and signs of gas contamination in household water supplies.

For more information visit our website at www.dec.state.ny.us/website/dmn.

MARKET VALUE

Prices and Market Value

In several ways, 2000 was a record year. The average wellhead price for both oil and gas increased by over 70% from the previous year. In fact, the average oil price of \$28.60 per barrel was the highest since this series of annual reports was started 17 years ago in 1984. The average gas price of \$3.75 per mcf was the highest since 1984.

The market value of the reported 17.7 bcf of gas produced was approximately \$66.38 million. The market value of the reported 180,590 barrels of oil produced was approximately \$5.16 million. Together, their total estimated market value of \$71.54 million was New York's highest since 1987.

The average wellhead prices for oil and gas were obtained from royalty payments made to the State for leases on State lands. However, national spot market prices were often higher; natural gas spot prices averaged \$8.36 per mcf in December 2000.

Leasing Royalties

The majority of landowners with producing oil and gas leases receive a royalty. Based on an average royalty of one-eighth of the production value, landowners in New York received roughly \$8.94 million in royalties from 2000 oil and gas production.

Property Tax Revenues

Communities in oil and gas producing areas also benefit from taxes assessed on production. Estimated real property tax revenues attributable to reported 2000 oil and gas production were approximately \$2.14 million. Taxes on natural gas and oil production were calculated to be \$1.99 million and \$159,000 respectively.

To help prevent sharp swings in tax receipts, the New York State Division of Equalization and Assessment uses a floating five-year average to determine the unit of production value. Local governments in turn use these average figures to assess taxes.

Volume Measurements Used in Report

Throughout this report, you'll find the following units of volume measurement used for production.

Natural Gas

mcf	thousand cubic feet
mmcf	million cubic feet
bcf	billion cubic feet

Crude Oil

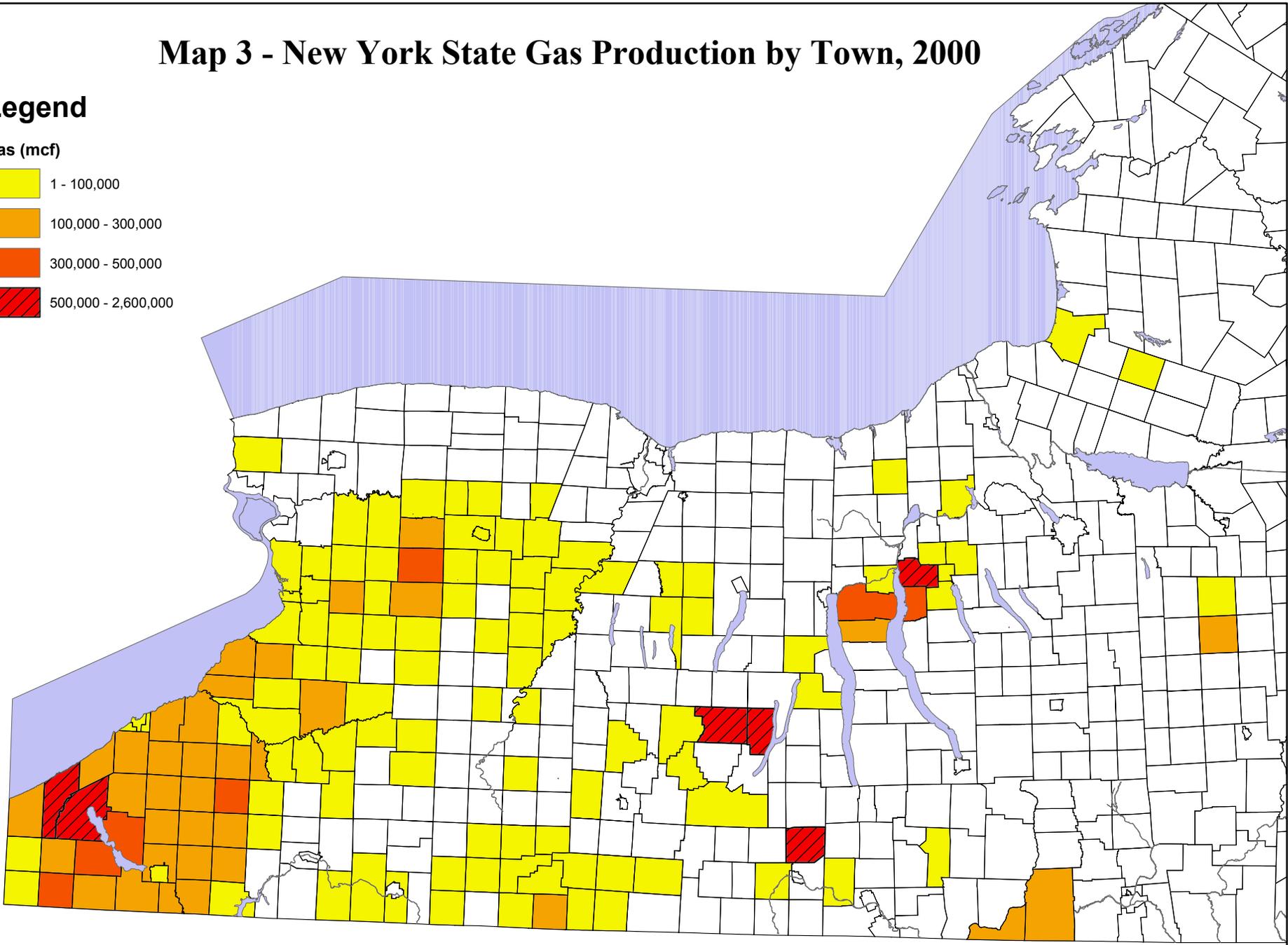
bbl	barrel of oil (42 gallons)
-----	----------------------------

Map 3 - New York State Gas Production by Town, 2000

Legend

Gas (mcf)

- 1 - 100,000
- 100,000 - 300,000
- 300,000 - 500,000
- 500,000 - 2,600,000

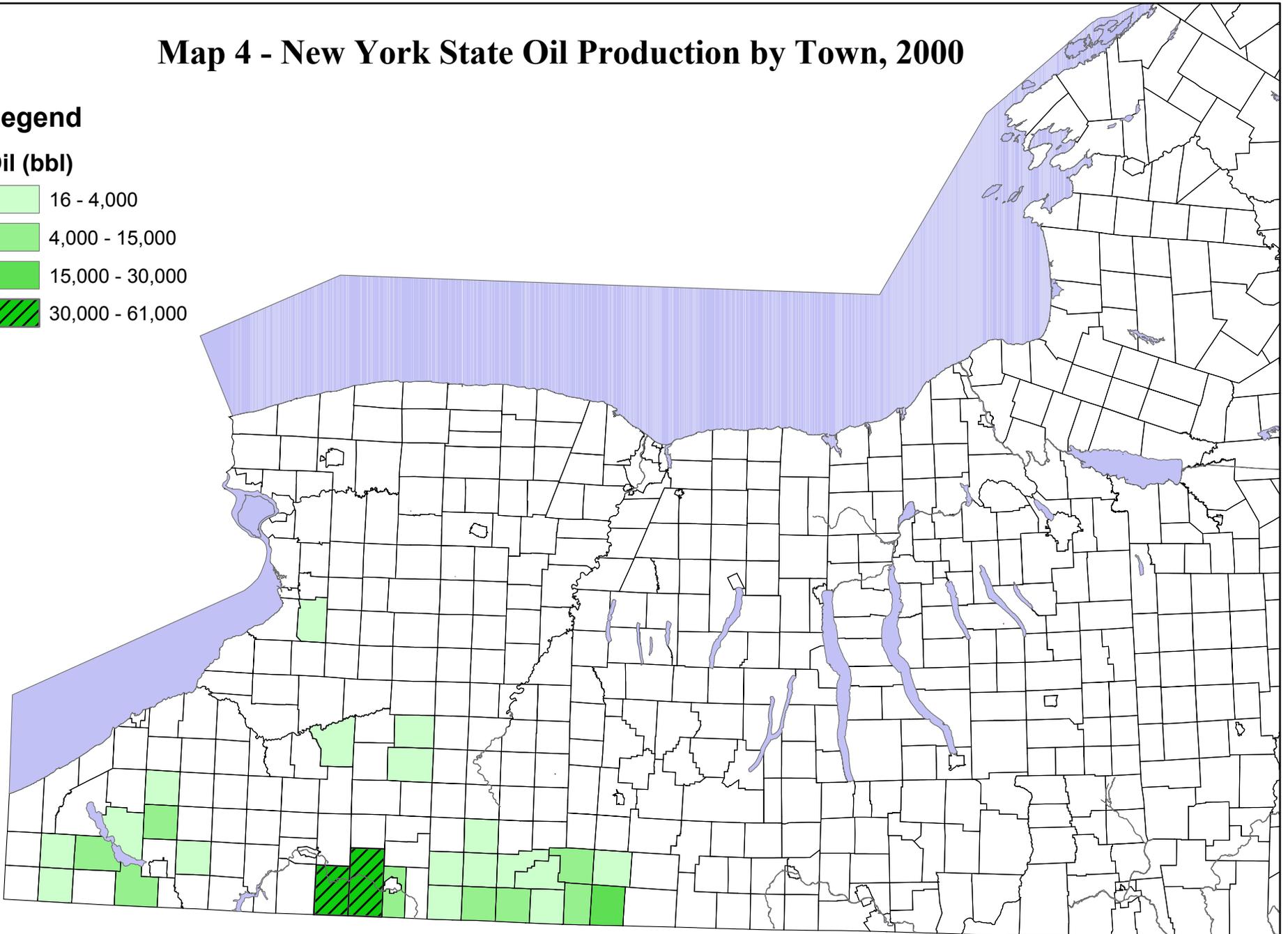


Map 4 - New York State Oil Production by Town, 2000

Legend

Oil (bbl)

- 16 - 4,000
- 4,000 - 15,000
- 15,000 - 30,000
- 30,000 - 61,000



STATE LAND LEASING PROGRAM

At the end of year 2000, the Division managed 85 leases covering 61,684 acres of State land, an increase of 212 acres from the 1999 year-end total. There were 184 productive oil and gas wells in which acreage from 40 different state leases earned royalties. These wells produced 300,000 mcf of natural gas and 215 barrels of oil. Leasing of State land for oil and gas development involves consultation at many levels. Adjustments are made in drilling and operation plans to accommodate the needs of both the public and the long-term goals of the Unit Management Plan for the parcel.

Consultation

Before a drilling permit is issued for any well on State land, an on-site meeting is held between the operator, DEC staff and other interested parties. This leads to site-specific conditions on construction of the access road and well site, disposition of lumber, prevention of erosion and sedimentation, reclamation of disturbed land, protection of state and federally-listed animals and plants, and resolution of any other site-specific concerns. In the case of the well in Photo 3:

- The local riding club was consulted about re-location of a horse trail.
- Activities were planned so a wetland adjacent to the well site remained undisturbed.
- A gate was installed on the access road.

Leasing and Private Land

DEC regulates oil and gas well drilling, production and plugging, but does not regulate private contractual matters involving oil and gas leases. However, we do provide some basic information in our brochure entitled "A Landowner's Guide to Oil and Gas Leasing". This information is available on our web site at <http://www.dec.state.ny.us/website/dmn>.



Photo 3. This gas well on State land in central NY is expected to be one of the largest wells in the State when it starts producing.

Reclamation and Wildlife

Approximately 2.5 acres were originally needed for the access road and drill site. However reclamation reduced the disturbed area to one acre. Based on guidelines in the Unit Management Plan, DEC Forestry staff decided to leave the area open and directed the operator to plant an experimental grass known as Tioga Deer Tongue. Over the next few years, DEC Foresters and Wildlife staff will evaluate the success of the grass as wildlife fodder.

LEASING AND OTHER REVENUES

The Division of Mineral Resources collects revenues from oil and gas activity under the Oil, Gas and Solution Mining Law. In 2000, total oil and gas revenues were \$354,751; permits and fees were \$164,525; fines and penalties were \$8,350; and leasing revenues from State lands were \$181,876.

- Royalties totaled \$79,390, an increase of 21% from the previous year. This was a direct result of higher product prices. Natural gas prices averaged \$3.75 per mcf for the year and oil prices averaged \$28.60 per barrel.
- Delay rentals from 31 leases netted \$42,280; down from the previous year's total of \$43,365. The reason for the decline was late payments of substantial delay rentals by one operator, which will be recorded in 2001.

- Fourteen storage leases added \$61,738, down from 1999's total of \$69,689. The reason for the decline was a late payment from one storage operator, which will be recorded in 2001.

The largest contributor to State leasing revenue in 1999, over 94%, was from the sale of State leases. No sales of State leases were held in 2000, so overall revenues are down substantially from the prior year. Year 2000 revenues of \$183,408 are down over 94% from the 1999 total of \$3,206,406.

Eight wells in which the State has a royalty interest were drilled in 2000 and all were successfully completed and await pipeline connections to begin production. These wells should substantially increase the State's net gas production in the year 2001.

STATE LANDS - EMERGING ISSUES

Several important issues relating to the Division are emerging for the next several years.

Thousands of older unplugged wells exist throughout New York State. A small proportion of these wells are currently causing pollution problems and others may eventually develop problems. The primary threat is to fresh water resources. The Division has identified a number of unplugged wells on both public and private lands that are rated a priority for plugging. Through the State's Environmental Audit process, the Division has initiated proceedings to plug the problem wells on State lands. This effort will begin to address the problem.

The Division is also developing methods to enhance processing of revenues from lease rentals, gas storage fees and oil and gas lease royalties. These improvements will ensure that revenue

payments are made in a timely fashion and facilitate audits of operators making payments to the State.



Photo 4. This leaking gas well on State land is a safety problem. Abandoned wells can also cause oil leaks, kill vegetation and contaminate ground and surface waters with oil, gas or brine.

REGION 7 & 8 REVIEW - Trenton-Black River

As promised in last year's report, Trenton-Black River exploration and development provided dramatic results during 2000. Large drilling rigs, significant volumes of natural gas and spectacular flares captured the interest of the public and industry alike. Of the six new Trenton-Black River fields discovered in 2000, four were located in Chemung County and the remaining two fields in Schuyler County.

Almost half of the 74 drilling permits issued in Regions 7 and 8 were for the Trenton-Black River formations. Drilling activity ranged from Steuben County on the west to as far east as Cortland County. Requests for information about the leasing process from landowners, local governments and industry also increased significantly in 2000. Issues such as spacing, unitization, reclamation and ground and surface water protection are commonly discussed.

Several local groups have taken an active role in providing information regarding oil and gas leasing activity. County Cornell Cooperative Extension Services, Farm Bureaus and local governments sponsored several meetings throughout the year. At times, these forums attracted several hundred people. Staff participated in seven public meetings during 2000 with approximately 750 people attending.

Drilling on public lands proved to be both successful and controversial during 2000. Two new fields were discovered on State Reforestation Areas in Schuyler County. In fact, a well drilled on State land is thought to be one of the more significant Trenton-Black River discoveries. All of the State land activity in 2000 involved some form of site preparation that affected recreational users such as hikers and horseback riders. As a result, staff responded to numerous concerns from these users. In the end, the specific recreational features involved were improved before being placed back into service.



Photo 5. The "I ♥ NY" sign on this rig shows the industry's enthusiasm for drilling Trenton-Black River wells.

Drilling on State lands requires coordination between the Surface Land Manager, Division of Mineral Resources and operators. Division staff sponsored a two-day seminar on the regulatory and operational aspects of oil and gas activity for Forest Rangers and State Land Managers in the Divisions of Lands and Forests and Fish and Wildlife. Over 100 Department managers took part in the meeting. The seminar involved both lectures and field visits to wells in various stages of operation.

Staff were involved in oil, gas and solution mining projects in 18 of the 25 counties comprising Regions 6, 7 and 8. To no one's surprise, the Trenton-Black River activity in the Southern Finger Lakes Region required the highest level of attention. To accommodate the demand and increase department oversight of these activities, a Mineral Resources Specialist was assigned to the Department's Horseheads Suboffice at the Chemung County Airport.

The year 2000 may prove to be the breakout year for Trenton-Black River exploration as operators found success throughout the Southern Finger Lakes Region.

REGION 9 REVIEW

It was a busy year for industry in Region 9, helped along by the nationwide increase in gas prices. The Allegany office received a total of 80 drilling permit applications (up 40% from 1999). Successful Trenton-Black River drilling in surrounding areas also sparked heavy leasing activity. Hundreds of landowners in Allegany, Cattaraugus, and Wyoming counties were approached by several companies, including some new to the region.

Plugging activity held steady with 127 applications (up three from 1999). However, well transfer requests remained at an unusually high level of 1,450 (down slightly from 1999's historic record of 1,600). Violations at transferred wells are frequent enough that each well must be inspected before transfer approval can be given. If problems are found, the new owner must sign an agreement to remedy all problems.

Special projects for the year included a program to inspect all known oil and gas wells in Wyoming and Niagara counties. The project covered more than 500 wells, some of which had not been inspected in over ten years. The much lower than expected number of brine tank violations was welcome news; a dramatic improvement that may be related to a well-publicized brine tank enforcement effort the previous year.



Photo 6. Gas well with new plastic brine tank in Town of Java, Wyoming County. Rustproof tanks can help prevent leaks.

Another enforcement success involved collection of a \$100,000 fine for an operator's illegal brine discharges and abandoned wells in Chautauqua and Cattaraugus counties. The case was in litigation for several years and took significant effort from both technical and enforcement staff.

Region 9 staff continued using GPS (global positioning system) equipment to document the location of lost and abandoned wells. New York has thousands of old wells with poor or non-existent records on both their location and condition. Most of the 220 wells surveyed in 2000 were in Allegany County's old oil field and had been left unplugged and abandoned for decades. Such wells have a high potential for polluting groundwater. Staff also discovered abandoned separation tanks; some still contained oil, some had leaks that had never been cleaned up and one was still receiving oil from a flowing well.

Courthouse searches are often needed to determine the responsible party for abandoned wells and tanks like these. The required research can be difficult, but staff identified the owner of several Allegany County wells abandoned for 30 years. The owner was contacted and is now working to bring the wells into compliance.



Photo 7. An old abandoned well behind a beaver dam, found during 2000 GPS work in the Town of Bolivar, Allegany County.

UNDERGROUND GAS STORAGE

Twenty-two natural gas and three liquefied petroleum gas underground storage facilities operated in nine counties in the western and central parts of New York during 2000. Combined maximum daily deliverability from New York's natural gas storage fields increased by about 15 million cubic feet per day as the result of a permitted pressure and capacity increase at the Honeoye storage field in Ontario County. The Department has recently issued a permit to convert Stagecoach field in Tioga County into a storage facility. The operator projects that when Stagecoach field is fully operational, it will increase statewide natural gas deliverability from storage by 35%.

Natural Gas Storage

Table 5 summarizes the 2000 year-end status of underground natural gas storage in New York and Table 6 details activity during the year at each storage field. New York's 22 underground natural gas storage reservoirs were 76% full at the end of the reporting year, compared to 82% at the end of 1999. Year-end working gas in storage represented 50% of working capacity in 2000, compared to 63% in 1999. New York's relatively low storage fill levels mirrored the national situation during the early winter of 2000 - 2001.

Honeoye Storage - During 2000, the Division processed one underground storage modification permit for a capacity increase at an existing field. Honeoye Storage Company increased the field's permitted maximum storage capacity by 2,188 million cubic feet, to be achieved through a series of pressure increases up to a maximum stabilized reservoir pressure of 1,100 psi. The State's permit was issued on December 15, 2000, and maximum pressure reported by Honeoye for the year was 1,085 psi.

Stagecoach - Division staff continued during 2000 to review the application submitted in late 1999 by Central New York Oil and Gas Co., LLC, (CNYOG) to convert the Stagecoach natural gas production field in Tioga County to storage service. In October 2000, CNYOG began drilling core wells at the site to collect data to support its proposal to operate the proposed Oriskany storage field at a pressure which exceeds original pressure of the natural gas reservoir. As an interstate gas storage facility, the Stagecoach field is also regulated by the Federal Energy Regulatory Commission (FERC). The Department fully participated in the FERC process throughout the year. Division staff attended a public meeting

convened by FERC in Owego, reviewed all pertinent materials submitted to FERC, and provided comments to FERC in March and October. Public participation in the federal process was encouraged by the Department. Notice was placed in the Environmental Notice Bulletin on September 27, 2000, informing interested parties of the comment period on the Environmental Assessment issued by FERC.



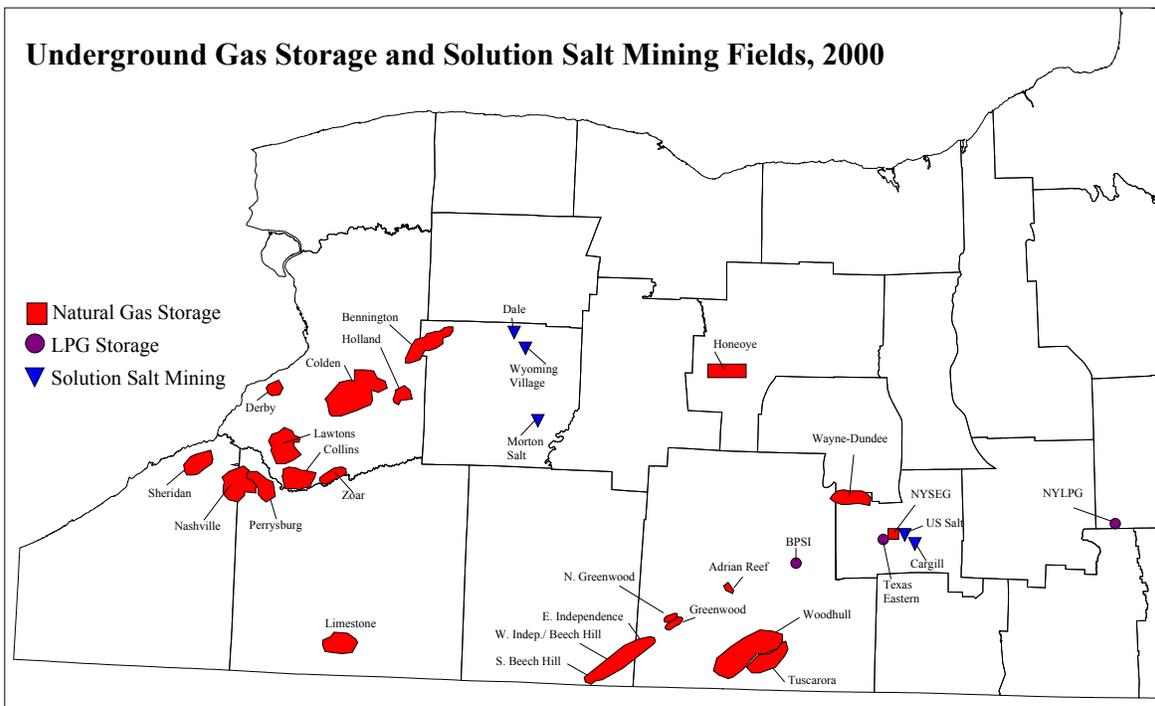
Photo 8. Drilling of a new storage well at the Stagecoach Field.

Liquefied Petroleum Gas Storage

New York's three liquefied petroleum gas (LPG) underground storage facilities are in Cortland, Steuben and Schuyler counties. The facilities store propane, butane and other liquid hydrocarbons for delivery to the market as needed. For the end of 2000, the facility operators reported a combined total of 21.4 million gallons in storage, or 14 percent of their total storage capacity.

Inactive Projects

Construction of the proposed BP Amoco LPG facility, that the Department permitted in 1998 for Silver Springs, Wyoming County, remained postponed throughout 2000. Two Steuben County natural gas storage fields permitted in the mid-1990's also remained inactive throughout 2000. These include the Avoca salt cavern storage project, where the thirteen wells associated with the project are currently owned by New Avoca Gas Storage, LLC, and the Thomas Corners field in Steuben County, owned by Steuben Gas Storage Company. FERC had previously set an in-service deadline of July 27, 2000, for Thomas Corners; no activity took place during 2000, and Steuben Gas Storage Company did not request an extension of this deadline.



Map 5. New York has 22 underground natural gas storage facilities, 21 in depleted reservoirs and one in a solution-mined cavern. Liquefied petroleum gas is stored in caverns excavated in the shales of the Genesee Group or solution mined out of the Salina Group salt formations, which are the same formations used by New York's four solution mining facilities.

Table 5

**Summary and Year-End Status 2000
Underground Natural Gas Storage**

	Onondaga	Oriskany	Medina	Salt Cavern	Total
Number					
Fields	2	9	10	1	22
Wells	43	300	524	3	870
Acreege					
Reservoir	2,473	25,751	42,630	4	70,858
Total	7,112	56,905	102,946	4	166,967
Total Storage Gas					
Capacity (bcf)	10.700	121.004	59.208	2.340	193.252
Year-End (bcf)	8.107	93.167	44.799	1.240	147.313
Working Gas					
Capacity (bcf)	6.863	56.727	27.773	1.450	92.813
Year-End (bcf)	4.270	28.890	13.364	0.350	46.874
Max Daily Deliverability (mmcf/day)	100.0	671.0	511.0	145.0	1,427.0

How to Apply for an Underground Storage Permit

A permit is required for a new underground storage facility or a capacity modification to an existing facility. A pre-application meeting with the DEC is recommended. Below is a summary list of application requirements:

1. An Organizational Report Form.
2. Financial Security to guarantee plugging of wells (incl. idle and inactive).
3. A Transfer of Well Plugging Responsibility Form (if taking over other operator's wells).
4. A completed full Environmental Assessment Form.
5. A map of proposed reservoir boundaries and locations of storage wells and plugged and abandoned wells.

6. A report on the reservoir's suitability for storage usage.
7. Well Status and Condition Report for each existing well (reservoir and buffer).
8. An affidavit regarding storage rights acquired (min. 75%) and agreement to acquire remaining storage rights.
9. A permit application fee: new facilities \$10,000, modifications \$5,000.

For more details on application requirements and information on what constitutes a facility modification visit:

<http://www.dec.state.ny.us/website/dmn/storperm.htm>

Table 6

**Summary by Company and Field, 2000
Underground Natural Gas Storage**

	Total Number Wells	Total Storage Capacity (bcf)	Gas to Storage (bcf)	Gas from Storage (bcf)	Designed Max. Deliverability (mmcf/day)
Columbia Gas Trans. Corp.					
Dundee Field	134	11.000	3.544	4.164	77.0
Greenwood Field	7	3.600	0.029	0.048	5.0
N. Greenwood Field	2	3.200	0.257	0.289	8.6
Dominion Transmission, Inc.					
Woodhull Field	51	35.904	17.417	17.658	357.0
Honeoye Storage Corp.					
Honeoye Field	39	10.708	2.820	4.022	54.7
National Fuel Gas Supply					
Beech Hill Field	41	23.000	3.712	4.241	66.0
Bennington Field	64	5.000	1.690	1.911	75.3
Colden Field	166	16.220	6.095	7.368	110.0
Collins Field	47	5.880	1.953	2.863	50.0
Derby Field	14	0.250	0.112	0.133	5.0
E. Independence Field	12	6.400	2.168	1.768	14.7
Holland Field	26	2.600	0.704	0.907	25.0
Lawtons Field	31	2.470	0.796	1.283	21.0
Limestone Field	14	19.800	0.996	1.584	37.0
Nashville Field	71	8.530	3.086	3.547	110.0
Perrysburg Field	40	3.850	1.418	1.998	35.0
Sheridan Field	26	3.700	0.937	1.083	25.0
Tuscarora Field	8	6.300	2.587	4.434	57.0
W. Independence Field	31	11.800	4.157	3.298	48.7
Zoar Field	31	2.200	1.692	1.688	40.0
NYS Electric & Gas					
Seneca Lake Field	3	2.340	1.092	1.746	145.0
Steuben Gas Storage Co.					
Adrian Reef Field	12	8.500	4.519	5.643	60.0
Totals	870	193.252	61.781	71.676	1,427.0

WELL SPACING AND INTEGRATION - New Trenton-Black River Fields

Trenton-Black River wells tend to be prolific producers that drain large areas, so the statewide minimum well spacing of 40 acres is insufficient. Unit sizes as large as 320-640 acres have been established through the public hearing process required by law. Table 7 summarizes the Trenton-Black River spacing rules established since 2000. The location of these fields is shown on Map 6. These large drainage areas have been historically recognized. The 1969 order for the Blue Tail Rooster field in northern Cayuga County established 320-acre units and required wells to be no closer than 1,000 feet from any unit boundary.

Laws and regulations require, among other things, that spacing units be of approximately uniform size and shape and that no unit should be smaller than the maximum area that can be efficiently and economically drained by one well. The objectives of these requirements are that: 1) wells are appropriately spaced to prevent waste of oil and gas resources, and 2) all owners of produced resources are fairly compensated. Unit configuration is based on field-specific geology and reservoir characteristics.

Upon successful completion of the first well in a new field, the operator is directed by the Department to determine the expected drainage area for wells in the field and to propose spacing units. The drainage area determination is based on analysis of pressure and production testing combined with geologic evaluation of data collected before, during and after drilling of the well. Once an operator presents a proposal to the Department, geologists and engineers in the Division of Mineral Resources evaluate it to ensure conformance with legal requirements and sound engineering and geologic principles. When staff concur that the proposal is satisfactory, a public hearing is convened to present the proposal to the public and seek input from affected parties.

High-volume Trenton-Black River wells often require several months of reservoir drawdown (i.e., production) to collect sufficient data to estimate drainage area. Royalties generated during this test production phase are placed in interest-bearing escrow accounts until units are formally established by a Commissioner's Decision and Order. The escrow requirement ensures that all royalty revenue is distributed based on final spacing unit configuration. The Department encourages operators to estimate future drainage areas and propose spacing units as early as possible in a field's development, using results from the initial well and analogy to existing fields with similar characteristics.

Large spacing units frequently include unleased mineral interests. If an operator cannot secure unleased acreage, then the law provides for the compulsory integration or forced pooling of interests within the unit. The Department recommends terms for compulsory integration at the public hearing convened to establish spacing rules. The result of compulsory integration is that any owners of unleased acreage within the production unit will receive just and reasonable compensation for drainage of natural gas from their acreage.

**For a map showing
oil, gas and solution
mining wells in your
area, visit our web-
site at:**

<http://www.dec.state.ny.us/website/dmn/wells1.htm>

Map 6 - Trenton-Black River Fields, Central New York

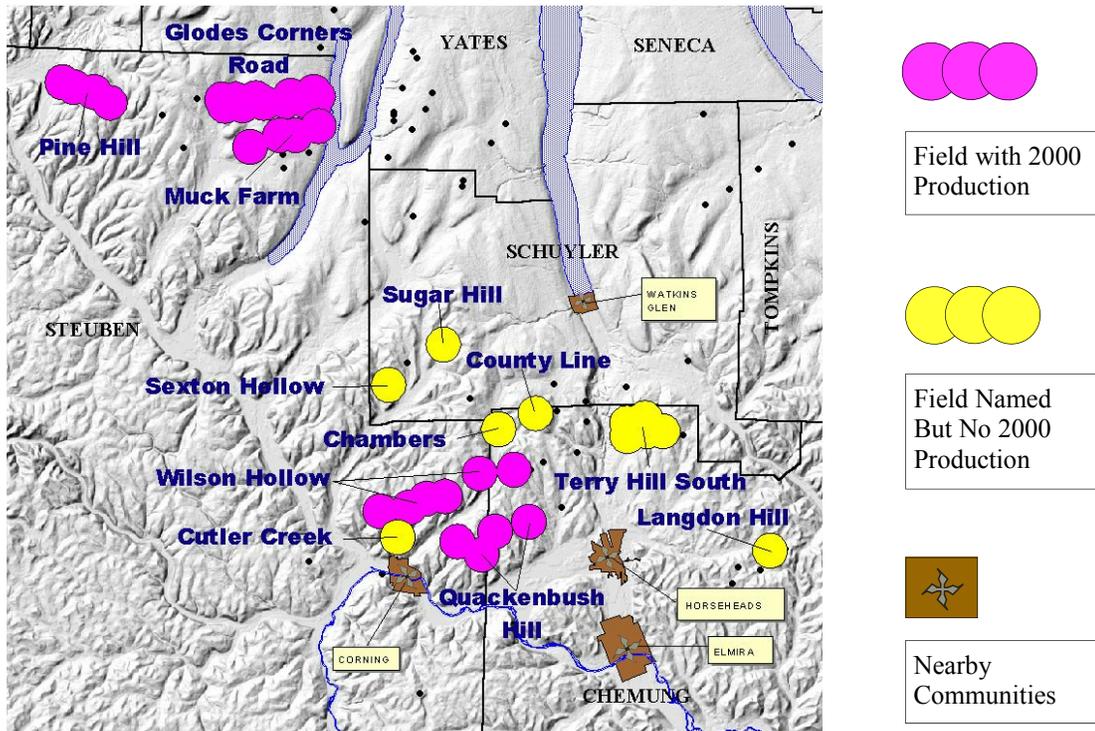


Table 7

Trenton-Black River Spacing Orders

Field	Effective Date	Unit Sizes For Wells Drilled Before Order	Allowable Unit Sizes Future Wells	Minimum Spacing Future Wells
Glodes Corner Road	5/30/00	158 - 246 acres	150 - 640 acres	1 mile apart
Muck Farm	1/31/00	432 - 516 acres	320 - 640 acres	1 mile apart
Wilson Hollow	6/21/01	497 - 635 acres	320 - 640 acres	1 mile apart
Quackenbush Hill	proposed	631 - 638 acres	560 - 640 acres	9,000 ft. apart

SOLUTION MINING

Five solution mining facilities in New York (see map 5 on page 15) produced 2.20 billion gallons of saturated brine, or about 2.5 million metric tons of salt, in 2000. Operators of these five facilities injected 2.30 billion gallons of fresh and recycled plant process water into bedded salt zones of the Upper Silurian Salina Group to recover the brine. Brine withdrawals for 2000 represent a slight increase compared to 1999's figure of 2.14 billion gallons. The value of New York's 2000 solution salt mining production is estimated at \$100 million.

The 154 operating wells reported in 2000 include injection wells, withdrawal wells, wells equipped for both injection and withdrawal, and standby wells. Table 8 gives the number of operating and plugged wells at each facility. Solution miners in New York withdraw brine from both single-well and multi-well caverns. Operators of multi-well caverns sometimes al-

ternate wells between injection and withdrawal in order to balance dissolution, which occurs mostly at the injection well. This helps to control the size and shape of the caverns. Other techniques used to maximize salt production while ensuring cavern stability include horizontal drilling and roof padding.

U.S. Salt, Cargill, and Morton produced brine to supply on-site evaporation plants which manufacture and package table salt, water conditioning salt, and salt for other uses. Texas Brine's fields supply two chemical manufacturing plants in Niagara Falls via 60-mile-long brine pipelines. In 2000, solution mining facilities accounted for approximately 40 percent of New York's total mined salt production, with the remainder extracted by conventional underground mining. According to U.S. Geological Survey statistics, New York typically ranks third among the states in total annual salt production volume.

Table 8

Status of Solution Salt Mining in New York, 2000

Operator	County	Town	Year Started	Operating Wells	Plugged Wells
U.S. Salt	Schuyler	Reading	1893	11	61
Cargill	Schuyler	Dix	1898	15	13
Morton	Wyoming	Castile & Gainesville	1884	18	24
Texas Brine	Wyoming	Middlebury (Dale Field)	1970	55	85
Texas Brine	Wyoming	Middlebury (Wyo. Vil. Field)	1984	55	11
Total				154	194

History Photo



Solution mining wells are similar to oil and gas wells in construction except they produce brine. Underground salt beds are dissolved by fresh water injected down the well.

The State's first solution mining well was drilled in 1878, but the State was regulating salt produced from brine springs near Syracuse as early as 1797.

Photo 9. Solution Salt Mining Well and Drilling Derrick, Watkins Glen, New York.

This well was drilled in 1898. The photo, taken in the 1990s, shows a site in downtown Watkins Glen that commemorates the importance of the solution mining industry to the area.

MINED LAND RECLAMATION PROGRAM

In 2000, there were 2,475 active mines in New York State with mining in every DEC Region except the Region 2 - New York City area. Mined Land Reclamation staff conducted 1,554 field inspections during the year 2000, traveling over 140,000 miles. These inspections covered 41% of the 2,546 unreclaimed mines. New staff additions in 2000 made it possible to reach mines that had not been inspected for years. Many of the inspections revealed violations of permit conditions which required additional compliance and enforcement efforts. The following selection of regional highlights illustrates the diverse types of challenges and successes that Mined Land staff experienced in 2000.

Region 1

Regional staff conducted the final reclamation inspection of a golf course that was built in Port Washington by the Town of North Hempstead. The course was built in the former Colonial Sand and Gravel pit. At one time, this was the largest sand pit in the state, supplying large amounts of construction material to Manhattan and the surrounding metropolitan area.



Photo 10. The former Colonial Sand and Gravel Pit now provides recreation and open space for the local community.

After an extensive review process, Region 1 issued a permit for Roanoke Sand and Gravel on Long Island. Mining at the site will result in creation of a 151-acre freshwater lake. The major public concern was over potential impacts to the area's drinking water. In response, the applicant agreed to install many monitoring devices to protect water supplies.



Photo 11. The Town of North Hempstead's reclamation included ponds and vegetation which attract wildlife.

Region 3

Thalle Industries, Inc. entered into an Order on Consent and agreed to pay a \$110,000 penalty for mining 5 acres of land beyond the permitted limits of their mine in the Town of East Fishkill, Dutchess County. The Department required surveys of the cleared areas and volume calculations of the mining beyond approved limits. The tree cutting and removal of 95,000 cubic yards of material from a hillside was considered particularly serious since it increased the mine's visual impacts, particularly on Scenic Hudson's nearby hiking trails. In addition to the fine, Thalle was required to revegetate the illegally mined areas. The terms of the Consent Order require verification photographs of the new vegetation every 60 days for two years to show how it is progressing.

Region 4

Noise and visual issues emerged as the most significant environmental issues associated with St. Lawrence Cement's application for a new \$300,000,000 cement plant in the middle of an existing quarry in Hudson. The proposed plant would be 350 feet high and operate 24 hours per day in an area where there is no history of night operations.

Region 5

During an archeological survey required in connection with the proposed Jointa-Galusha quarry application in the Town of Hartford, Washington County, the applicant's consultant found evidence of prehistoric chert mining from 4,000 to 6,000 years ago. The chert was used for cutting edges on weapons and knives for processing game.

Region 6

A permit application was submitted to mine granite in the White Lake area of the Town of Forestport, Oneida County at the site of an old quarry dating back to the early 1900s. The actual quarry size would be 5 acres out of a life of mine size of 28.5 acres. Granite would be cut on-site for dimension stone. This type of work requires frequent blasts using very small amounts of material (mostly primacord) several times a day. The site is located within the Adirondack Park and coordination with the Adirondack Park Agency is ongoing.

Region 7

In May 2000, the New York State 1999 Annual Reclamation Award winner, Porter's Concrete Service, also won a national reclamation award from the Interstate Mining Compact Commission (IMCC). It was a special small operator award for innovative reclamation at Porter's Barton and Waverly Mines in Tioga County. Mr. Porter and other family members live in homes on reclaimed acreage at the Waverly mine which also hosts dozens of international-prize-winning Simmental cattle. Trees, fruit orchards and other vegetation provide screening.

Region 8

In August of 2000, AKZO Nobel Salt Inc. (Akzo) was presented the Annual New York State Mined Land Reclamation Award at the New York State Fair for the closure and restoration of their underground salt mine in Livingston County. Akzo also won the National Association of State Land Reclamationists (NASLR) Award for 2000. The company surmounted numerous technical difficulties to successfully reclaim the mine which collapsed in 1994. The mine had been in operation for over 100 years and it extended over nine square miles underground. When the roof collapsed, water flooded the mine. The company closed six shafts, reclaimed the plant and stockpile area, rebuilt a collapsed bridge, donated seven acres with a pond to the Town of Groveland for fishing access and another 650 acres to the Genesee Valley Conservancy to remain forever wild.

Region 9

The Buffalo Crushed Stone quarry in Cheektowaga continued to be controversial. The company hired Vibra-Tech Inc. to analyze its blasting practices and recommend improvements to reduce complaints from surrounding residents. BCS also agreed to test a treatment to reduce hydrogen sulfide levels in the quarry water before discharge. The New York State Department of Health also agreed to perform a database search to determine if there is a higher concentration of cancer and respiratory diseases in the vicinity of the quarry and two nearby landfills.



Photo 12. The reclaimed Barton Mine boasts a 32-acre lake, island and a scenic access bridge.

Regions 3, 4 & 7 Bluestone Mines

Bluestone mines are relatively small, usually one to five acre mines, that occur in steep forested areas of Regions 3, 4 and 7. The rock is used primarily for landscaping and architectural purposes. Many bluestone mines were not in compliance before the Division started a compliance initiative in 1999.

By the end of 2000, the Division's continued efforts working with the industry roughly tripled the number of mines permitted or in the permit process.



Photo 13. Bluestone mining's high waste rock to product ratio of 8 to 1 or more presents site management and reclamation challenges.

NY Affected and Reclaimed Mined Lands/ 2000

2000 Mining Acreage

Mining permits are issued for a set term of 5 years so they must be periodically renewed. The acreage currently under permit.

Affected Acreage - 48,863

Applicants must identify the total area expected to eventually be mined at locations currently under permit.

Life-of-Mine Acreage - 99,922

2000 Reclaimed Acreage

In 2000	287 acres
Final	89 acres
Concurrent	198 acres

**Since 1975
17,987 acres
of mined land
have been reclaimed.**



Statistics in this report refer solely to mines that need a permit under the Mined Land Reclamation Law.

- ♦ More than 1,000 tons or 750 cubic yards of minerals in 12 consecutive months.
- ♦ More than 100 cubic yards of minerals in or adjacent to any body of water not classified as “protected” by Article 15 of the ECL.

Lands affected by mining before 1975 and not re-affected by later mining are not subject to the Law.

2,475 Active Mines In 2000

Permits Issued In 2000

New permits	71
Renewal permits	290
Total	361

Size of Active Mines for 2000

minor projects	85
0 - 5 acres	901
6 - 10 acres	603
11 - 20 acres	436
21 - 30 acres	155
> 30 acres	295
Total	2,475

**Remember
If it can't be grown
It has to be mined!**

Owner Type For 2000

Industry	1,837
Town	542
County	78
State	18
Total	2,475

Financial Security

At the end of 2000, the Division of Mineral Resources held \$77,100,754 to guarantee reclamation when mines are abandoned or a company goes bankrupt.

The abandoned mine site at the right had been a focus of concern for local residents and state legislators. The reclamation work was accomplished with money recovered from surety bonds that the department seized in accordance with the Law.



Photo 14. Mined Land Staff and Region 5 Operations staff complete reclamation of an abandoned mine in Washington County.