New Mexico State Highway Department
Geology & Aggregate Resources
District 3

Prepared by

Geology Section

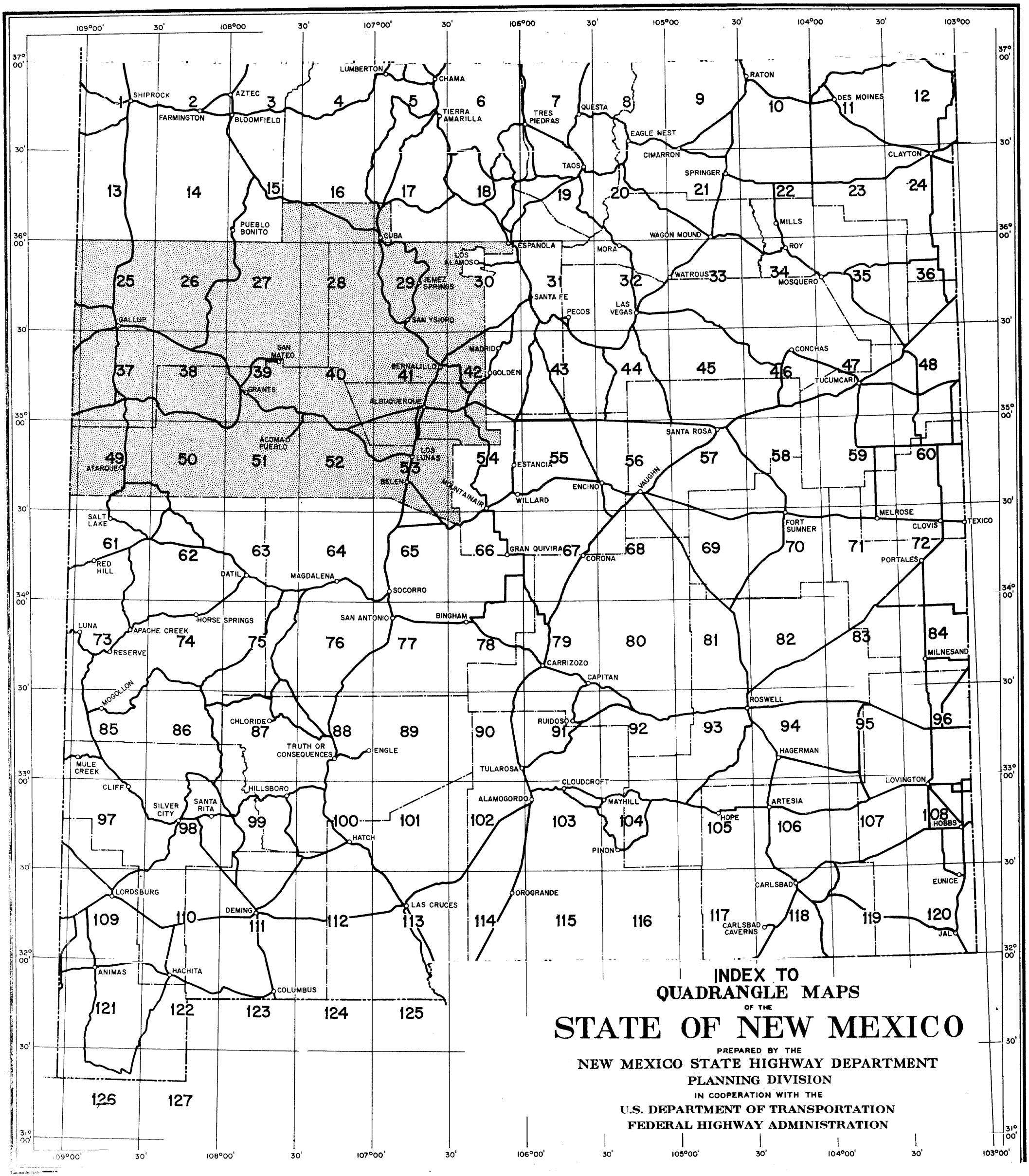
New Mexico State Highway Department

Materials Laboratory Bureau

in cooperation with

U.S. Department of Transportation

Federal Highway Administration



INDEX TO QUADRANGLE MAPS OF THE STATE OF NEW MEXICO

PREPARED BY THE
NEW MEXICO STATE HIGHWAY DEPARTMENT
PLANNING DIVISION
IN COOPERATION WITH THE
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

Preface

Personnel of the Geology Unit, NMSHD, continue mapping the surface geology of New Mexico as it applies to the availability of suitable road building aggregates. This project was initiated in its present form in 1968 and has been carried on as a Research Project by use of Federal Highway Planning and Research funds through the Planning Division of the New Mexico State Highway Department in cooperation with the United States Department of Transportation, Federal Highway Administration.

The fundamental purpose behind the use of geology to locate suitable deposits for any road-building project is one of basic economics. The length of haul (pit to job-site) is a critical economic factor on any construction job. For every mile of haul that can be eliminated, the resultant savings of tax dollars varies from 5 to 10 cents per ton mile. It can readily be seen that eliminating one mile of haul on a job requiring 500,000 tons, which is not an unusual amount, will result in an immediate cost reduction between 25,000 to 50,000 tax dollars. Since New Mexico is the fifth largest state of the conterminous United States and its highway network must of necessity be expanded, it is obvious that the long-term savings generated by this project could approach astronomical proportions. Because of the potential enormity of such savings, this mapping program will ultimately pay great dividends to the beleagurered taxpayer. It is hoped that it will also result in new and additional geological information for the professional geologist as well as the layman and that it will create a renewed interest in the Quaternary geology from a scientific and academic viewpoint. Increased knowledge of aggregate science and a general knowledge of the characteristics of the rocks upon which a road foundation is to be built should also improve the quality of our future highway network.

The approach to locating road-building aggregate is no different than the search for other natural resources. A working hypothesis that will show why suitable aggregate can or cannot be found and having a reasonable understanding of the risk involved is necessary. Most reconnaissance efforts are nothing more than common-sense attempts to establish some predictability as to what should be expected when a test hole is dug. Delineating various pediment or terrace levels regarding age continuity, material type and a myriad of other characteristics, easily eliminates useless prospecting where a particular hypothesis suggests that no suitable aggregate will be found. Carrying this approach further, a working hypothesis can be developed to locate aggregate accumulations that are totally obscured from view, such as hidden, buried stream channels. Riskwise, easily delineated geomorphic or bedrock surfaces can be classed as probable resources, whereas those that are totally obscured from view would be classed as probable or exploratory. Landforms with developed and tested pits would, of course, be classed as proven sites. It is not the purpose of this study to show all of the locations where material pits may be placed. The purpose is to show the prospector a reasonable cross-section of the type of materials he may be able to locate in a particular landform or bedrock formation. Most aggregate prospecting will be and has been done on diagnostic landforms and are medium to low-risk ventures. Exploratory sites will be higher risk ventures and usually will not be attempted except in circumstances of last resort.

This publication should help the prospector establish a workable approach in locating materials pits and be an improvement over the somewhat fortuitous approach that has been used in the past. We are aware that pit sites located from photographic interpretation of geology do not guarantee success, and the results provided by test holes ultimately prove or disprove an aggregate source. However, over a long term, the use of practical geology for aggregate prospecting will be of great benefit to the construction industry.

The geology and aggregate resources maps are presented in color on the regular N.M.S.H.D. base maps, 30 minute quadrangles, one inch equals 3 miles. They are placed in numerical order as the state numbering system pertains to N.M.S.H.D. District 3. Each map has an explanation of the rock units mapped and other symbols used that do not appear on the standard legend for the base maps. Most of the symbols used are self-explanatory; however, in order not to confuse the reader, the pit symbols and numbering system probably deserve some additional explanation.

The solid black circle denotes an existing pit or quarry; the half-black circle denotes a prospective site that has been sampled and tested; and the asterick indicates a prospective site that has not been sampled or tested. The numbers beside the circles refer directly to the material pit summary charts and the charts are placed directly behind the geology and aggregate resource maps. All numbers preceded by a zero represent prospective pit sites. Numbers not preceded by a zero represent the year and numerical sequence in which the pit was explored, i.e., pit 6457 is the fifty-seventh pit explored by the laboratory crews in 1964.

The greatest single difficulty encountered in mapping Quaternary deposits is establishing continuity of map units and symbols over reasonably long distances. Since Quaternary stratigraphy is morphostratigraphic (both geomorphic and stratigraphic) and this work done by several geologists, the reader will find some discontinuity of map units or stratigraphic nomenclature from one quadrangle to another in the Quaternary and Tertiary systems. In this event each map should be studied individually since the purpose of this study is to aid the prospector in choosing the best possible source of aggregate in a particular area.

If this and the following publications benefit the taxpayers of New Mexico through a systematic approach in developing and conserving another of the state's natural resources, then its primary objective will have been accomplished. And if it is utilized by those within and without the geological profession to further the knowledge of New Mexico geology then the subsidiary objectives will also have been accomplished.

CONTENTS

ACKNOWLEDGEMENTS

Many people have contributed to this mapping project. The authors wish to express their thanks to these persons and firms, and others too numerous to mention here, who have contributed to the production of this book.

Offset	:	Duplicating Services, N.M. S.H.D.
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Material Investigation Crews	:	N.M.S.H.D
Personnel of the Testing Lab	:	N.M.S.H.D.
Geology Section Personnel	:	Warren T. Bennett, Geotechnical Engr., Mapping, Author and Editor; Arlon D. Lovelace, Chief Geologist, Author and Editor; James B. Yarbrough, Geologist, Geological Research Author, Mapping; Daniel D. Sowle, Geologist, Mapping, Sampling; Richard D. Lueck, Geologist, Mapping, Sampling; William A. Gonzales, E.T. III, Drafting and Artwork; Ray Salazar, E.T. II, Drafting and Artwork

LEGEND FOR BASE MAP UNITS

Roads
- Primitive
- Unimproved
- Graded and Drained
- Gravel or Stone-not Graded and Drained
- Gravel or Stone-Graded and Drained
- Bituminous Surfaced
- Paved
- Divided Highway
- Road or Street in congested area

Mileage indicated thus — 1.9 — 0.6 — 0.8
Highway Interchange
Federal Aid Interstate Highway Number — FAI 25
Federal Aid Primary Highway Number — FAP 41
Federal Aid Secondary Highway Number — FAS 1441
End of Federal Aid Route — FAP 4
Federal Aid Interstate Highway Number — 10
U.S. Highway Number — 84
State Highway Number — 30

- National or State Line
- County Line
- Indian Reservation, Military Reservation, National Park, National Monument, National Forest, State Park and Game or Bird Refuge Line
- Land Grant Line
- City Limit Line
- Township Line

Boundaries and Monuments
- Section Line-Surveyed
- Boundary Monuments
- Triangulation Station
- Identical Lookout and Triangulation Station
- Identical Airway Beacon and Triangulation Station
- Identical Church and Triangulation Station
- Identical Schoolhouse and Triangulation Station
- Identical Building and Triangulation Station
- Permanent Bench Mark and Elevation — BM 1533
- Prominent Elevation — 7520'
- Township Corner in Place
- Section Corner in Place
- State Capital
- County Seat
- Other City, Town or Village

City, Town or Village
- City, Town or Village (Incorporated)
- Town or Village (Dashed Line denotes limits of Supplementary Vicinity Map)

- Dwelling or Farm Unit
- Group of Dwellings (Figure denotes number of units)
- Hotel
- Store or Small Business House
- Post Office
- Business and Post Office

Farms, Dwellings, Industrial Units, etc.
- City Hall
- Schoolhouse
- Church
- Cemetery
- Hospital
- Factory or Industrial Plant
- Electric Power Station
- Radio Station
- Correctional Institution
- Sawmill
- Drive-in Theater
- Fire Station
- Historic Ruin
- Vacant Units are shown by open symbols, thus:
- Figure denotes number of units of like kind

- Mine
- Corral
- Windmill
- Well or Water Tank
- Artesian Wells
- Oil or Gas Wells
- Forest Ranger Station, District
- Forest Ranger Station, Yearlong
- Forest Ranger Station, Seasonal
- Permanent Lookout Station
- Camping Ground
- Railroad
- Narrow Gauge Railroad
- Railroad Tunnel
- Railroad Station (Local Agent)
- Railroad Station (Prepay)

Railroad Crossings
- Grade
- Railroad above
- Railroad below

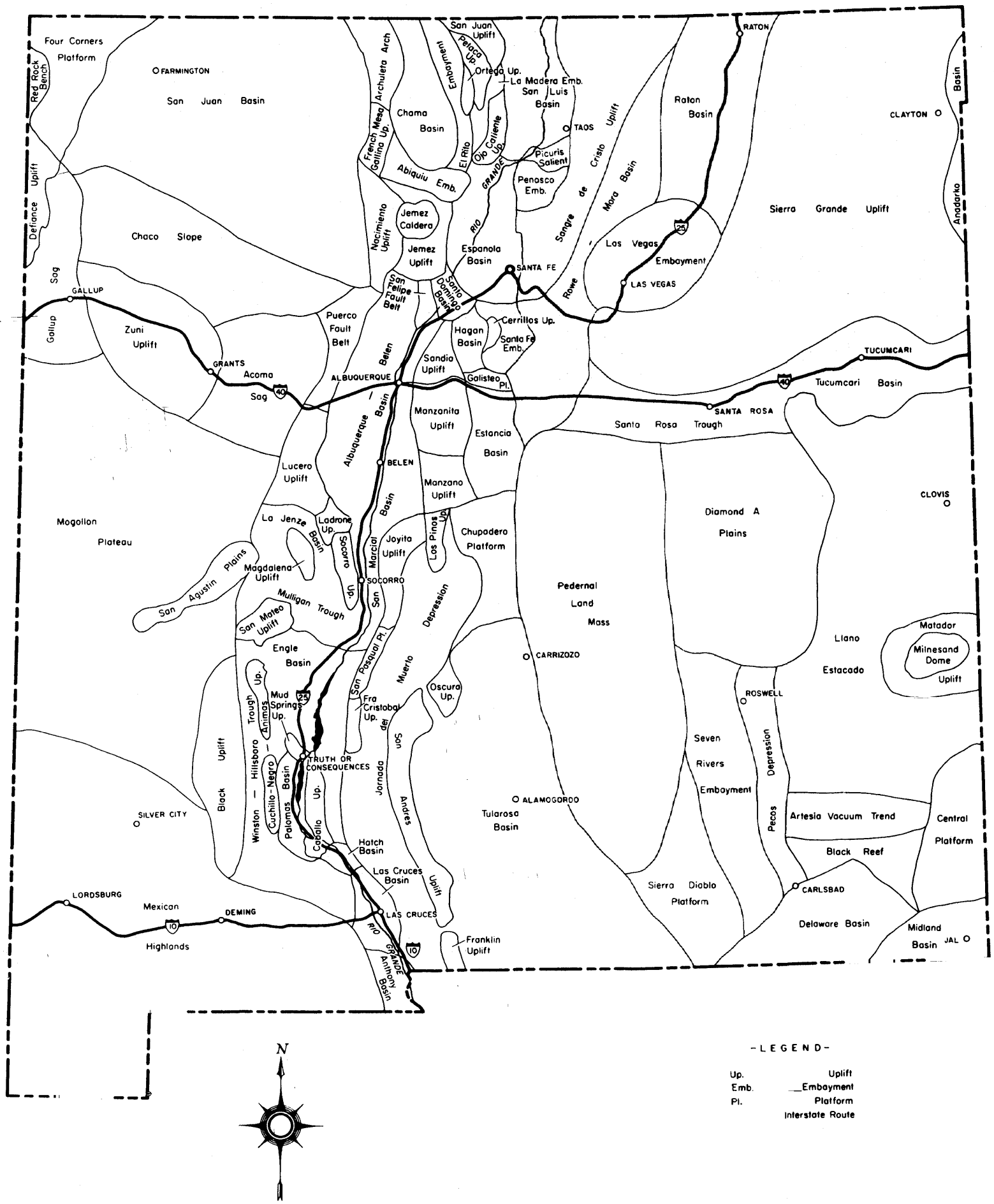
Bridges
- Railroad
- Highway (over 20' span)

- Ford
- Dam on Large River
- Dam on Small Stream
- Reservoir and Dam
- Ditch or Canal
- Flume
- Syphon
- Pipe Line or Conduit
- Tramway
- Telephone or Telegraph Line
- Telephone or Telegraph Line along road
- Transmission Line
- Fence (any type)
- Spring
- River
- Stream
- Intermittent Stream
- Large Intermittent Stream
- Marsh or Swamp
- Levee or Dike
- Mountain Range, Mesa or Butte
- Sink or Depression

Air Navigation
- Air Route
- Army, Navy or Marine Corps Field
- Commercial or Municipal Airport
- Intermediate Field
- Landing Area or Strip
- Airway Light Beacon

AGGREGATE RESOURCES AND GEOLOGY
NEW MEXICO STATE HIGHWAY DEPARTMENT

STRUCTURAL UNITS OF NEW MEXICO



GEOLOGIC TIME CHART

ERAS	PERIODS (of time) or SYSTEMS (of rock)	EPOCHS or SERIES	APPROXIMATE TIME IN YEARS SINCE BEGINNING OF EACH	PHYSICAL AND BIOLOGICAL FEATURES
CENOZOIC	QUATERNARY	Recent	10,000-15,000	Development of man.
		Pleistocene	1,000,000	Ice sheets over Europe and North America; appearance of early man.
	TERTIARY	Pliocene	11,000,000	Development of modern plants and animals; formation of mountains in western America.
		Miocene	25,000,000	Highest development of larger mammals; formation of mountains, including the Alps, Andes, and Himalayas.
		Oligocene	40,000,000	Development of higher mammals.
		Eocene & Paleocene	70,000,000	Rise to dominance of mammals; appearance of ancestral horse and primates.
MESOZOIC	CRETACEOUS		135,000,000	Extinction of dinosaurs; development of early mammals and flowering plants; deposit of chalk beds.
	JURASSIC		180,000,000	Appearance of flying reptiles and birds; dominance of dinosaurs; appearance of primitive mammals; abundance of coniferous trees.
	TRIASSIC		230,000,000	Appearance of dinosaurs; dominance of reptiles; appearance of cycadaceous trees.
PALEOZOIC	PERMIAN		280,000,000	Development of reptiles; decline of huge plants of the Mississippian and Pennsylvanian.
	PENNSYLVANIAN		310,000,000	Age of coal; formation of coal beds from luxuriant plant life in warm, swampy forests; great fernlike trees; appearance of primitive conifers; abundance of insect life; first appearance of reptiles; development of amphibians.
	MISSISSIPPIAN		345,000,000	
	DEVONIAN		400,000,000	Age of fish; appearance of primitive amphibians; development of primitive plant life on dry continents.
	SILURIAN		425,000,000	Appearance of scorpions, the first animals to live on dry land; extensive coral reefs.
	ORDOVICIAN		500,000,000	Floods and recessions of shallow seas; deposits of limestone, lead, and zinc ores; abundance of marine invertebrate life; appearance of a few primitive fishlike vertebrates.
	CAMBRIAN		600,000,000	Shallow seas over much of the land; formation of sedimentary rocks; development of marine invertebrate life, including brachiopods, snails, sponges, and trilobites.
PRECAMBRIAN	PROTEROZOIC		1,500,000,000	Formation of mountains; deposits of iron ore; abundance of lime secreting algae; appearance of sponges.
	ARCHEOZOIC		2,000,000,000+	Great volcanic activity; formation of igneous rocks; some microscopic algae; probably some protozoa.


Durango
Trinidad
RATON MESAS
MESA DE MAYA
PARK PLATEAU
Raton
6640
Capulin Mt.
Aztec
7000
San Juan R.
6000
Shiprock
9420
CHUSKA MTS.
MESA DE LOS VIEJOS
Chama R.
Taos
13144
TRUCHAS PK.
6000
TURKEY MT.
CORNUDO HILLS
OCATE MESA
Las Vegas
CANADIAN ESCARPMENT
Canadian R.
Dam
Tucumcari
NACIMIENTO MTS.
SIERRA DE LOS VALLES
JEMEZ MTS.
Santa Fe
CHACRA MESA
Gallup
ZUNI MTS.
Mt. Taylor
11389
MESA CHIVATO
MESA PRIETA
Puerco R.
SANDIA MTS.
ORTIZ MTS.
ESTANCIA VALLEY
GLORIETA MESA
PEDERNAL HILLS
Albuquerque
4950
San Jose
Acoma
MESA LUCERO
LAVA FIELDS
CEBOLLETA MESA
LADRONE PK.
MANZANO MTS.
SA. DE LOS PINOS
E
6093
6000
5000
Cl
4143
6000
GALLINAS MTS.
BEAR MTS.
DATIL MTS.
GALLO MTS.
PLAINS OF ST. AUGUSTINE
7000
MAGDALENA MTS.
SAN MATEO MTS.
Socorro
CHUPADERA MESA
OSCURA MTS.
JICARILLA MTS.
CAPITAN MTS.
SIERRA BLANCA
Roswell
3577
Pecos R.
ELEPHANT BUTTE RES.
FRA CRISTOBAL
JORNADA DEL MUERTO
SAN ANDRES MTS.
TULAROSA BASIN
SACRAMENTO MTS.
MOGOLLON MTS.
SIERRA MIMBRES
CABALLOS MTS.
WHITE SAND
Alamogordo
4320
MESCALERO ESCARPMENT
Gila
BURRO MTS.
SA. DE LAS UVAS
3111
Carlsbad
Pecos R.
Cavern
GUADALUPE MTS.
8787
Deming
4330
FLORIDA MTS.
4280
PYRAMID MTS.
ANIMAS V.
HATCHET MTS.
PLAYAS
CEDAR MTS.
TRES HERMANOS
ORGAN MTS.
FRANKLIN
El Paso
3865
HUECO MTS.
HUECO BOLSON
CORNUDAS MTS.
CERRO DIABLO
DIABLO PLATEAU
SALT BASIN
SA. PRIETA
DELAWARE
RUSTLER HILLS
PELONCILLO
ESCARPMENT
L.
H.
A

EXPLANATION

QUAD No. 15

QUATERNARY

- Qal — Alluvium
- Qe — Eolian deposits
- Qt — Terrace deposits
- Qp — Pediment deposits
- Qop — Older Pediment deposits

TERTIARY

- Tsj — San Jose Formation
- Tn — Nacimiento Formation
- TKoa — Ojo Alamo sandstone

CRETACEOUS

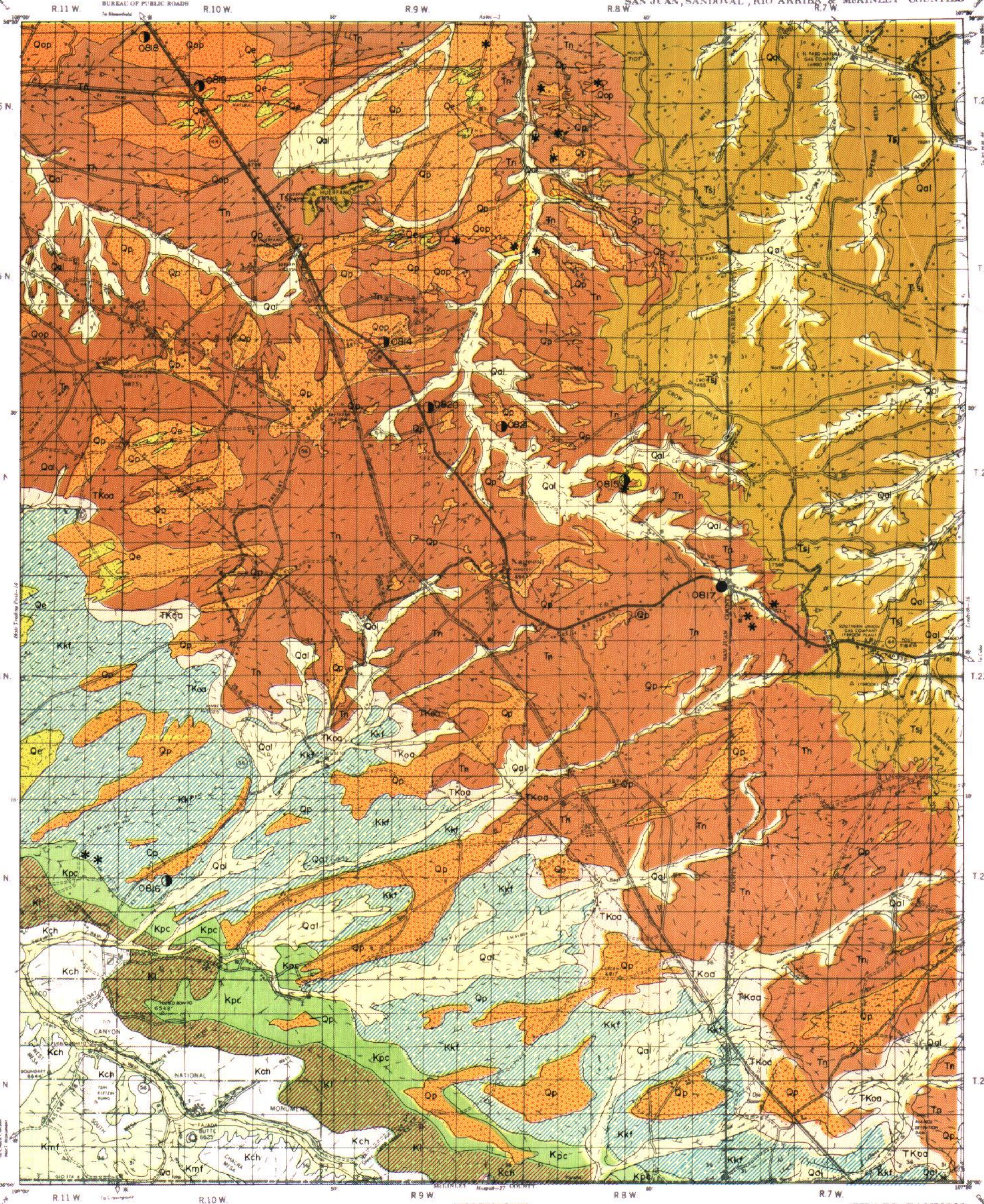
- Kkf — Kirtland-Fruitland Formations
- Kpc — Pictured Cliffs sandstone
- Kl — Lewis Shale
- Kch — Cliff House sandstone
- Kmf — Menefee Formation

- Developed Pit or Quarry
- Prospect Pit or Quarry
- Fault
- Downthrown side
- * Selected exploration site

NEW MEXICO STATE HIGHWAY DEPARTMENT
PLANNING AND PROGRAMMING DIVISION
BUREAU OF PUBLIC ROADS

GEOLOGY and AGGREGATE RESOURCES

CHACO CANYON QUADRANGLE—15
SAN JUAN, SANDOVAL, RIO ARRIBA & McKINLEY COUNTIES



Control by U.S. Coast and Geodetic Survey, U.S. Geological Survey, U.S. Forest Service, Bureau of Land Management and Planning Division—Modified Conic Projection Standard Parallel 36½° North American Datum

DATE OF INVENTORY
GEOLOGY JAN. 1975

AGGREGATE RESOURCES JAN. 1975

Longitude West from Greenwich

Scale 1/190080 or 1 Inch = 3 Miles

STATUTE MILES

DATE OF INVENTORY
McKINLEY COUNTY 1964
RIO ARRIBA COUNTY 1967
SANDOVAL COUNTY 1961
SAN JUAN COUNTY 1967

CHACO CANYON
QUADRANGLE
15

CONSTRUCTION MATERIALS INVENTORY

MATERIAL PIT SUMMARY

Pit Number		0814	0815	0816	0817
Location	Section	NE 1/4 32	E 1/2 21	NE 1/4 20	E 1/2 1
	Township & Range	25N 9W	24N 8W	22N 10W	23N 8W
	County	San Juan	San Juan	San Juan	San Juan
Formation		Qp	Qp	Kkf	Qal
Rock Type		sand & gravel	sand & gravel	red dog (baked shale)	sand & gravel
Source Rock (Gravel)		s.s., & petrified wood	conglomerate	-	conglomerate
Quality of Material		fair	good	good	good
Thickness of Material		20' plus	15' plus	10' plus	2-5'
Thickness of Cap (Caliche)		-	-	-	-
Material Underlying Formation		shale	shale	shale & sandstone	shale
Vegetation		sage & grass	scrub & pinon	scrub brush & grass	pinon, pine & grass
Local Terrain		hilly	rolling, hilly	hilly	hilly with mesas
Thickness of Overburden		0-2'	0-1'	0-3'	0-2'
P. I. (Overburden)		-	-	-	-
Estimated Quantity (cu. yds)		100,000 plus	200,000 plus	100,000 plus	50,000
Los Angeles Wear		46.3 average	32.4	47.9	31.2
Soundness Loss		29,8	13.6	9.2	51.1
Average Maximum Size		4"	3"	-	3"
% Retained on 2" Sieve		15	4	-	2
Pit Average % Passing	Crushed to:	as received	as received	1 1/2"	as received
	2"	96	96	100	97
	1"	88	92	56	90
	½"	83	86	25	75
	No. 4	68	75	13	62
	No. 10	53	68	9	54
	No. 200	11	8	2	11
Plasticity Index		S.N.P.	S.N.P.	S,N,P,	S.N.P.

Remarks:

Pit Number		0818	0819	0820	0821
Location	Section	SE 1/4 7	S 1/2 21	SE 1/4 4	SE 1/4 12
	Township & Range	26N 10W	26N 10W	24N 9W	24N 9W
	County	San Juan	San Juan	San Juan	San Juan
Formation		Qop	Qe	Qal	Qp
Rock Type		sand	sand	sand	fine sand
Source Rock (Gravel)		-	-	-	-
Quality of Material		fair	good	good	fair
Thickness of Material		10' plus	15' plus	10' plus	20' plus
Thickness of Cap (Caliche)		-	-	-	-
Material Underlying Formation		shale	shale	-	shale
Vegetation		grass & scrub brush	grass & scrub brush	grass, scrub, juniper	grass, scrub, juniper
Local Terrain		minor hills	small hills	hilly	hilly
Thickness of Overburden		-	-	-	-
P. I. (Overburden)		-	-	-	-
Estimated Quantity (cu. yds.)		200,000	200,000 plus	unlimited	unlimited
Los Angeles Wear		-	S.E.: 39	S.E.: 61	-
Soundness Loss		-	-	-	S.E.: 10.0
Average Maximum Size		No. 4	1/4"	no. 4	no. 10
% Retained on 2" Sieve		-	-	-	-
Pit Average % Passing	Crushed to:	as received	as received	as received	as received
	2"	no. 4: 99	no. 4: -	no. 4: -	-
	1"	no.10: 98	no.10: 100	no.10: 100	no.10: 100
	½"	no.40: 90	no.40: 95	no.40: 85	no.40: 95
	No. 4	no.80: 49	no.80: 55	no.80: 37	no.80: 74
	No. 10	no.100: 35	no.100: 41	no.100: 27	no.100: 66
	No. 200	no.200: 15	no.200: 14	no.200: 8	no.200: 33
Plasticity Index		N.P.	S.N.P.	S.N.P.	N.P.

Remarks:

0821: clay stringers in sampled area.

EXPLANATION

QUAD No. 16

QUATERNARY

- Qal — Alluvium
- Qp — Pediment deposits

TERTIARY

- Tsj — San Jose Formation
- Tn — Nacimiento Formation

- ● Developed Pit or Quarry
- ◑ Prospect Pit or Quarry
- Fault
- Downthrown side
- * Selected exploration site

NEW MEXICO STATE HIGHWAY DEPARTMENT
PLANNING AND PROGRAMMING DIVISION
BUREAU OF PUBLIC ROADS

GEOLOGY and AGGREGATE RESOURCES

LINDRITH QUADRANGLE — 16
RIO ARRIBA & SANDOVAL COUNTIES

R.6 W. R.5 W. R.4 W. R.3 W. R.2 W.

T.26 N. T.25 N. T.24 N. T.23 N. T.22 N. T.21 N.

Tsj Qal Qp Tn

6503 6122 6222 6121 5972 6875 6876

JICARILLA APACHE INDIAN RESERVATION

CONTINENTAL DIVIDE

RIO ARRIBA COUNTY SANDOVAL COUNTY MCKINLEY COUNTY

Control by U.S. Coast and Geodetic Survey, U.S. Geological Survey, U.S. Forest Service, Bureau of Land Management and Planning Division—Modified Conic Projection Standard Parallel 38½° North American Datum

Longitude West from Greenwich

Scale 1/126720 or 1 Inch = 2 Miles

DATE OF INVENTORY
RIO ARRIBA COUNTY 1967
SANDOVAL COUNTY 1961

LINDRITH QUADRANGLE 16

CONSTRUCTION MATERIALS INVENTORY

MATERIAL PIT SUMMARY

Pit Number		5972	6121	6122	6222
Location	Section	not sectionalized	not sectionalized	not sectionalized	not sectionalized
	Township & Range	Jicarilla Apache Res.	Jicarilla Apache Res.	Jicarilla Apache Res.	Jicarilla Apache Res.
	County	Rio Arriba	Rio Arriba	Rio Arriba	Rio Arriba
Formation		Ts,j	Ts,j	Qal	Ts,j
Rock Type		sand	sand	sand	sand
Source Rock (Gravel)		-	-	-	-
Quality of Material		good	fair	fair	fair
Thickness of Material		5' plus	9' plus	6' plus	5'
Thickness of Cap (Caliche)		-	-	-	-
Material Underlying Formation		sandstone	sandstone	silt	sandstone
Vegetation		scattered pinon	juniper & sage	sage	juniper & sage
Local Terrain		hilly	hilly	rolling	hilly
Thickness of Overburden		1'	4'	0-3'	1'
P. I. (Overburden)		S.N.P.	9	S.N.P.	S.N.P.
Estimated Quantity (cu. yds)		100,000 plus	200,000	155,000 plus	100,000 plus
Los Angeles Wear		-	-	-	-
Soundness Loss		S. E.: 61	-	S.E.: 43	S.E.: 39
Average Maximum Size		-	-	-	-
% Retained on 2" Sieve		-	-	-	-
Pit Average % Passing	Crushed to:	as received	as received	as received	as received
	2"	-	-	-	-
	1"	-	-	-	-
	½"	-	-	-	-
	No. 4	no.4: 94	-	no.10: 100	no.10: 100
	No. 10	no.10: 82	-	no.40: 92	no.40: 98
	No. 200	no.40: 36	100	no.80: 54	no.80: 73
		no.80: 16	22	no.200: 27	no.200: 34
		no.200: 07			
Plasticity Index		S.N.P.	N.P.	N.P.	N.P.
Remarks:					

Pit Number		6503	0874	0875	0876
Location	Section	not sectionalized	not sectionalized	SW 1/4 26	NE 1/4 31
	Township & Range	Jicarilla Apache Res.	Jicarilla Apache Res.	23N 5W	21N 5W
	County	Rio Arriba	Rio Arriba	Sandoval	Sandoval
Formation		Ts,j	Ti	Qp	Qp
Rock Type		sand	lamprophyre	gravel	sand & minor gravel
Source Rock (Gravel)		-	-	sandstone & igneous	-
Quality of Material		fair	good	poor	fair
Thickness of Material		12' plus	35' plus	5'	1-5'
Thickness of Cap (Caliche)		-	-	-	-
Material Underlying Formation		sandstone	sandstone	sandstone	sandstone
Vegetation		pinon & juniper	pine	grass	sage
Local Terrain		mountainous	mountainous	hilly	hilly
Thickness of Overburden		1'	-	0-2'	0-2'
P. I. (Overburden)		S.N.P.	-	S.N.P.	S.N.P.
Estimated Quantity (cu. yds.)		300,000 plus	100,000 plus	1,000 plus	250,000 plus
Los Angeles Wear		-	34.3	47.6	-
Soundness Loss		-	40.0	40.0	S.E.: 54
Average Maximum Size		-	-	3"	2"
% Retained on 2" Sieve		-	-	8	2
Pit Average % Passing	Crushed to:	as received	1"	as received	as received
	2"	-	-	100	-
	1"	-	100	84	-
	½"	-	59	40	no.10: 100
	No. 4	-	22	25	no.40: 88
	No. 10	100	11	21	no.80: 40
	No. 200	6	2	7	no.200: 17
Plasticity Index		N.P.	N.P.	N.P.	N.P.
Remarks:					

EXPLANATION

QUAD No. 17

QUATERNARY

- Qal — Alluvium
- Qao — Alluvial Apron deposits
- Qls — Landslide debris
- Qt — Terrace deposits (Post glacial)
- Qt_2 — Terrace deposits (Pinedale)
- Qt_3 — Terrace deposits (Late Bull Lake)
- Qt_4 — Terrace deposits (Early Bull Lake)
- Qt_5 — Terrace deposits (Pre-Wisconsin)
- Qp — Pediment deposits
- Qop — Older Pediment deposits
- Qbt — Bandelier Tuff
- QTp — Older pediment deposits

TERTIARY

- QTb — Basalt
- Tsj — San Jose Formation
- Te — El Rito Formation
- Tn — Nacimiento shale
- Ta — Abiquiu Tuff

CRETACEOUS

- Tt — Tschoma Formation
- TKoa — Ojo Alamo sandstone
- Kkf — Kirtland and Fruitland Formations
- Kl — Lewis shale
- Kmv — Mesaverde Group
- Km — Mancos Shale
- Kgh — Greenhorn Limestone
- Kgr — Graneros Shale
- Kd — Dakota sandstone

JURASSIC

- Jm — Morrison Formation
- Jet — Entrada and Todilto undivided

TRIASSIC

- Tru — Upper Triassic rocks (inc. Chinle)
- Trl — Lower Triassic rocks (inc. Santa Rosa)

PERMIAN

- Pc — Cutler Formation

PENNS.

- P — Pennsylvanian rocks undivided

PRE-CAMB.

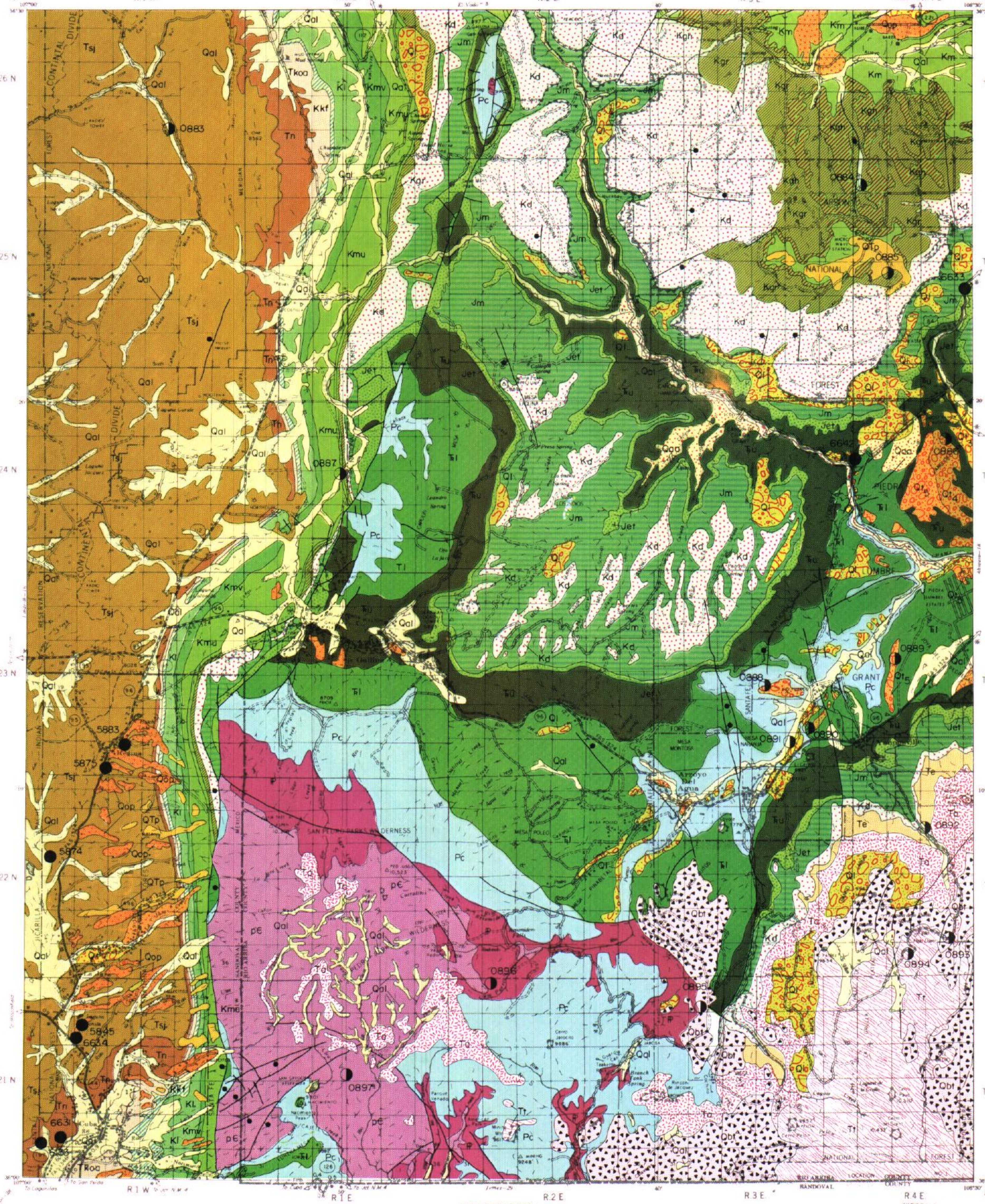
- p€ — Precambrian undivided

- Developed Pit or Quarry
- Prospect Pit or Quarry
- Fault
- Downthrown side
- Selected exploration site

NEW MEXICO STATE HIGHWAY DEPARTMENT
PLANNING AND PROGRAMMING DIVISION
BUREAU OF PUBLIC ROADS

GEOLOGY and AGGREGATE RESOURCES

CUBA QUADRANGLE—17
RIO ARRIBA & SANDOVAL COUNTIES



DATE OF INVENTORY
GEOLOGY MAR. 1975
AGGREGATE RESOURCES MAR. 1975

Scale $\frac{1}{190080}$ or 1 Inch = 3 Miles

DATE OF INVENTORY
RIO ARRIBA COUNTY 1967
SANDOVAL COUNTY 1961

CUBA
QUADRANGLE
17

CONSTRUCTION MATERIALS INVENTORY

MATERIAL PIT SUMMARY

Pit Number		5845	5874	5875	5883
Location	Section	SW 1/4 5	S 1/2 18	SE 1/4 32	NW 1/4 33
	Township & Range	21N 1W	22N 1W	23N 1W	23N 1W
	County	Sandoval	Sandoval	Sandoval	Sandoval
Formation		Qop	Qal	Qop	Qop
Rock Type		sand & gravel	gravel	gravel	gravel
Source Rock (Gravel)		igneous & various	various	various	various
Quality of Material		good	good	good	good
Thickness of Material		12'	7' plus	10'	11'
Thickness of Cap (Caliche)		-	-	-	-
Material Underlying Formation		sandstone & clay	sandstone & clay	silt & clay	silt & clay
Vegetation		grass	pine	sage & pine	sage & pine
Local Terrain		hilly	hilly	hilly	hilly
Thickness of Overburden		2-5'	2-5'	2-6'	2-8'
P. I. (Overburden)		S.N.P.	S.N.P.	10	11
Estimated Quantity (cu. yds)		9,000	25,000	10,000	8,000
Los Angeles Wear		21.4	25.4	23.2	23.8
Soundness Loss		4.7	15.9	8.0	14.1
Average Maximum Size		5"	6"	4"	4"
% Retained on 2" Sieve		5	17	13	15
Pit Average % Passing	Crushed to:	as received	as received	as received	as received
	2"	100	77	80	75
	1"	76	65	65	62
	½"	53	54	48	47
	No. 4	37	41	31	32
	No. 10	26	34	22	23
	No. 200	10	12	4	6
Plasticity Index		N.P.	N.P.	N.P.	N.P.

Remarks:

5845: pit 5540 nearby

Pit Number		6133	6631	6633	6634
Location	Section	SW 1/4 30	SE 1/4 30	S 1/2 22 & N 1/2 27	S 1/2 5
	Township & Range	21N 1W	21N 1W	25N 4E	21N 1W
	County	Sandoval	Sandoval	Rio Arriba	Sandoval
Formation		Qal	Qal	Qal	Qop
Rock Type		sand & gravel	gravel	sand & gravel	gravel
Source Rock (Gravel)		quartzite & igneous	various	sandstone & quartzite	various
Quality of Material		good	good	poor	good
Thickness of Material		2-8'	2-6'	20'	9'
Thickness of Cap (Caliche)		-	-	-	-
Material Underlying Formation		silty clay	silty clay	sandstone	clay
Vegetation		sage	sage	grass & juniper	pine
Local Terrain		hilly	hilly	mountainous	mountainous
Thickness of Overburden		0-2'	0-2'	0-6'	5'
P. I. (Overburden)		S.N.P.	8	S.N.P.	11
Estimated Quantity (cu. yds.)		30,000	20,000 plus	100,000	15,000
Los Angeles Wear		29.6	29.7	57.2	32.8
Soundness Loss		6.0	3.6	20.4	5.1
Average Maximum Size		4"	4"	6"	5"
% Retained on 2" Sieve		15	15	33	20
Pit Average % Passing	Crushed to:	as received	as received	as received	as received
	2"	95	91	85	68
	1"	77	78	62	58
	½"	62	63	50	50
	No. 4	50	50	42	33
	No. 10	40	41	38	19
	No. 200	8	13	14	8
Plasticity Index		N.P.	8	S.N.P.	5

Remarks:

CONSTRUCTION MATERIALS INVENTORY

MATERIAL PIT SUMMARY

Pit Number		6642	0883	0884	0885
Location	Section	SW 1/4 18	SE 1/4 27	SW 1/4 6	NW 1/4 20
	Township & Range	24N 4E	26N 1W	25N 4E	25N 4E
	County	Rio Arriba	Rio Arriba	Rio Arriba	Rio Arriba
Formation		Qt	Tsj	Kmgl	Qtp
Rock Type		sand & gravel	sand	limestone	gravel
Source Rock (Gravel)		various	-	-	various
Quality of Material		excellent	poor	fair	fair
Thickness of Material		9'	2-4'	3' plus	2'
Thickness of Cap (Caliche)		-	-	-	-
Material Underlying Formation		shale	silt & shale	sandstone & shale	shale & sandstone
Vegetation		juniper & grass	pine	pine	pine
Local Terrain		mountainous	canyon floor	mountainous	mountainous
Thickness of Overburden		4'	0-1'	1'	0-2'
P. I. (Overburden)		10	S.N.P.	S.N.P.	S.N.P.
Estimated Quantity (cu. yds)		25,000	50,000 plus	50,000 plus	5,000
Los Angeles Wear		21.2	S.E.: 71	22.6	40.2
Soundness Loss		7.9	-	5.7	1.2
Average Maximum Size		8"	-	-	4"
% Retained on 2" Sieve		40	-	-	29
Pit Average % Passing	Crushed to:	as received	as received	1"	as received
	2"	63	3/8": 100	-	72
	1"	47	No. 4: 96	100	51
	½"	35	No. 10: 88	59	39
	No. 4	25	No. 40: 34	21	35
	No. 10	20	No. 80: 13	10	31
	No. 200	5	No. 200: 7	2	24
Plasticity Index		N.P.	N.P.	N.P.	N.P.

Remarks:

Pit Number		0886	0887	0888	0889
Location	Section	not sectionalized	NW 1/4 22	not sectionalized	not sectionalized
	Township & Range	Piedra Lumbre Grant	24N 1E	Piedra Lumbre Grant	Piedra Lumbre Grant
	County	Rio Arriba	Rio Arriba	Rio Arriba	Rio Arriba
Formation		Qt(2)	Qal	Qp	Qt(5)
Rock Type		sand & gravel	sand	gravel	gravel
Source Rock (Gravel)		quartzite & igneous	-	various	basalt & quartzite
Quality of Material		excellent	fair	fair	good
Thickness of Material		5' plus	10'	1-4'	6' plus
Thickness of Cap (Caliche)		-	-	-	-
Material Underlying Formation		silt & sand	silt	sandstone	-
Vegetation		juniper	sage	grass & juniper	cactus & grass
Local Terrain		hilly	creek bottom	mountainous	hilly
Thickness of Overburden		0-2'	1'	0-2'	0-1'
P. I. (Overburden)		8	S.N.P.	S.N.P.	S.N.P.
Estimated Quantity (cu. yds.)		250,000 plus	1,000 plus	50,000	400,000 plus
Los Angeles Wear		32.6	-	38.5	30.3
Soundness Loss		33.8	S.E.: 64	16.2	7.4
Average Maximum Size		6"	-	6"	20"
% Retained on 2" Sieve		33	-	17	41
Pit Average % Passing	Crushed to:	as received	as received	as received	as received
	2"	69	-	92	62
	1"	46	-	77	48
	½"	31	No. 10: 100	69	38
	No. 4	21	No. 40: 79	60	31
	No. 10	18	No. 80: 24	53	27
	No. 200	5	No. 200: 9	24	15
Plasticity Index		N.P.	N.P.	N.P.	8

Remarks:

CONSTRUCTION MATERIALS INVENTORY

MATERIAL PIT SUMMARY

Pit Number		0890	0891	0892	0893
Location	Section	SE 1/4 26	NW 1/4 35	SW 1/4 14	SE 1/4 28
	Township & Range	23N 3E	23N 3E	22N 4E	22N 4E
	County	Rio Arriba	Rio Arriba	Rio Arriba	Rio Arriba
Formation		Qt (3)	Qt (2)	Te	QTb
Rock Type		sand & gravel	gravel	sand & gravel	basalt
Source Rock (Gravel)		igneous & various	basalt & various	sandstone & various	-
Quality of Material		good	good	good	good
Thickness of Material		6'	4' plus	15'	20' plus
Thickness of Cap (Caliche)		-	-	-	-
Material Underlying Formation		sandstone	sandstone	silt & sandstone	dacite
Vegetation		grass	juniper	pine	pine
Local Terrain		hilly	hilly	mountainous	mountainous
Thickness of Overburden		0-2'	0-2'	-	-
P. I. (Overburden)		S.N.P.	S.N.P.	-	-
Estimated Quantity (cu. yds)		125,000	75,000 plus	150,000 plus	300,000 plus
Los Angeles Wear		37.4	33.6	29.4	23.6
Soundness Loss		14.8	17.7	7.4	0.8
Average Maximum Size		5"	8"	4"	-
% Retained on 2" Sieve		27	31	7	-
Pit Average % Passing	Crushed to:	as received	as received	as received	1"
	2"	73	77	93	-
	1"	63	61	77	100
	½"	52	52	65	54
	No. 4	41	43	51	23
	No. 10	33	36	39	13
	No. 200	11	13	6	3
Plasticity Index		N.P.	N.P.	N.P.	N.P.

Remarks:

Pit Number		0894	0895	0896	0897
Location	Section	NE 1/4 32	SW 1/4 5	NW 1/4 5	SW 1/4 15
	Township & Range	22N 4E	21N 3E	21N 2E	21N 1E
	County	Rio Arriba	Rio Arriba	Rio Arriba	Rio Arriba
Formation		T†	Qbt	P	pЄ
Rock Type		dacite	tuff	limestone	granite
Source Rock (Gravel)		-	-	-	-
Quality of Material		good	good	good	good
Thickness of Material		50' plus	25' plus	5' plus	100' plus
Thickness of Cap (Caliche)		-	-	-	-
Material Underlying Formation		-	sandstone	sandstone	-
Vegetation		pine	pine	pine & spruce	pine
Local Terrain		mountainous	mountainous	mountainous	mountainous
Thickness of Overburden		-	1'	2'	0-3'
P. I. (Overburden)		-	S.N.P.	11	N.P.
Estimated Quantity (cu. yds.)		unlimited	325,000	125,000 plus	unlimited
Los Angeles Wear		23.2	66.0	35.6	52.6
Soundness Loss		4.0	1.2	4.8	4.1
Average Maximum Size		-	-	-	-
% Retained on 2" Sieve		-	-	-	-
Pit Average % Passing	Crushed to:	1"	1"	1"	1"
	2"	-	-	-	-
	1"	100	100	100	100
	½"	59	60	53	56
	No. 4	27	29	22	24
	No. 10	15	20	12	15
	No. 200	2	5	4	2
Plasticity Index		N.P.	N.P.	N.P.	N.P.

Remarks:

EXPLANATION

QUAD No. 25

QUATERNARY

- Qal — Alluvium
- Ql — Landslide Debris
- Qe — Eolian deposits
- Qt — Terrace deposits (Post Glacial)
- Qp — Pediment deposits
- Qop — Older Pediment deposits

TERTIARY

- Ti — Intrusive rocks undivided
- Tn — Nacimiento Formation
- Tt — Tschicoma Formation
- Tc — Older Cinders

CRETACEOUS

- Kmf — Menefee Formation
- Kpl — Point Lookout Sandstone
- Kcc — Crevasse Canyon Formation
- Kg — Gallup Sandstone
- Km — Mancos Shale
- Kd — Dakota Sandstone

- Jm — Morrison Formation

JURASSIC

- Jzs — Zuni, Summerville, and/or Cow Springs Sandstone
- Jt — Todilto Formation
- Je — Entrada Formation

TRAISSIC

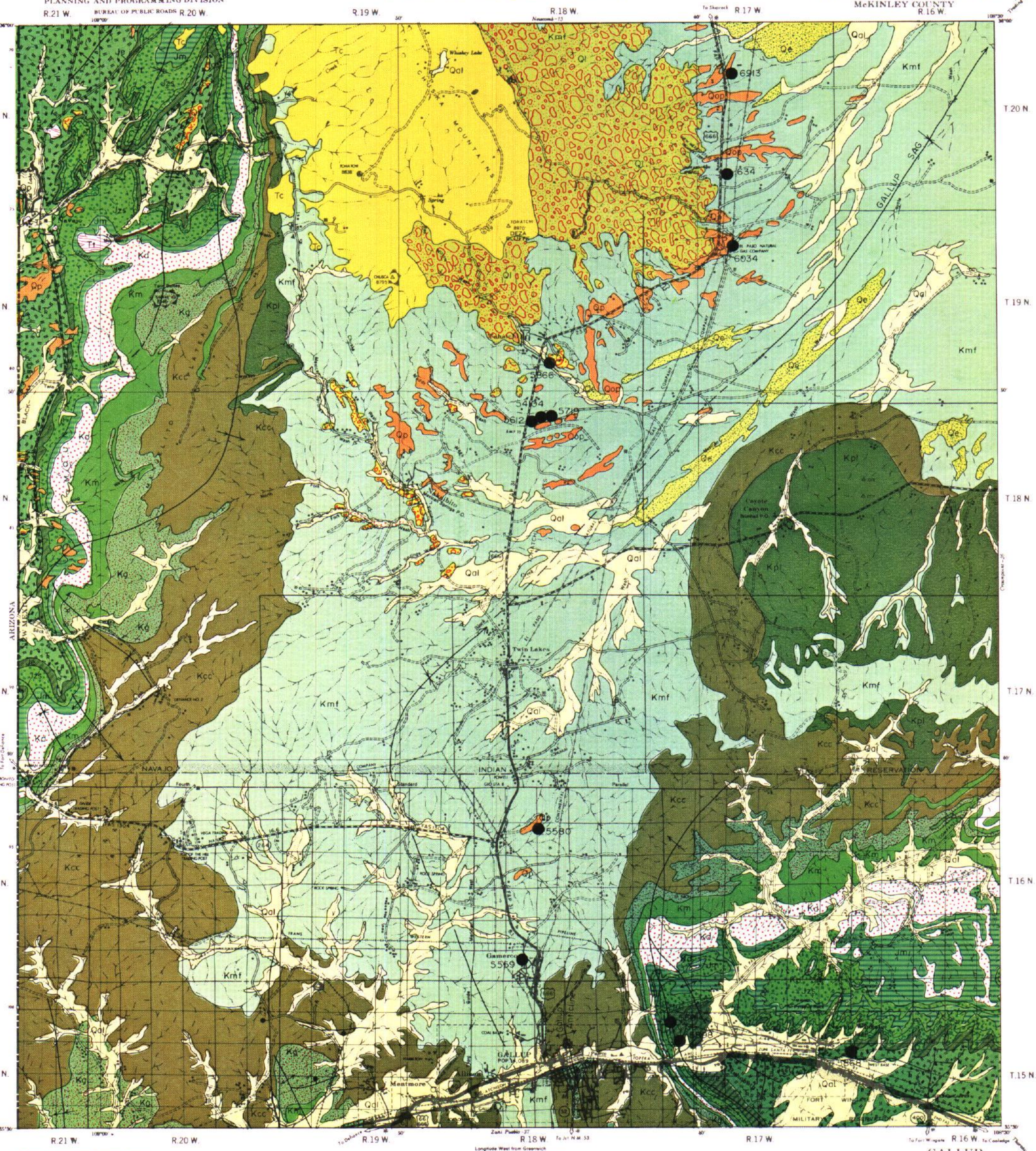
- R — Triassic rocks undivided

- Established pit or quarry
- Prospect pit or quarry
- Fault — downthrown side
- Anticline
- Syncline

NEW MEXICO STATE HIGHWAY DEPARTMENT
PLANNING AND PROGRAMMING DIVISION
BUREAU OF PUBLIC ROADS

GEOLOGY and AGGREGATE RESOURCES

GALLUP QUADRANGLE-25
McKINLEY COUNTY



Control by U.S. Coast and Geodetic Survey, U.S. Geological Survey, U.S. Forest Service, Bureau of Land Management and Planning Division—Modified Conic Projection Standard Parallel 34½° North American Datum

DATE OF INVENTORY
GEOLOGY OCT. 1977
AGGREGATE RESOURCES OCT. 1977

Longitude West from Greenwich

Scale 1/190720 or 1 Inch = 3 Miles

STATUTE MILES

GALLUP QUADRANGLE
25

CONSTRUCTION MATERIALS INVENTORY

QUADRANGLE PAGE 25(1)

MATERIAL PIT SUMMARY

Pit Number		504	5272	5366	5386
Location	Section	Section 17	SE1/2 Sec. 8	Not Sectionalized	Not Sectionalized
	Township & Range	15N 17W	15N 16W	SE of Tohatchi 9N 18W	15N 6W Fort Wingate
	County	McKinley	McKinley	McKinley	McKinley
Formation					
Rock Type					
Source Rock (Gravel)					
Quality of Material					
Thickness of Material					
Thickness of Cap (Caliche)					
Material Underlying Formation					
Vegetation					
Local Terrain					
Thickness of Overburden					
P. I. (Overburden)					
Estimated Quantity (cu. yds)					
Los Angeles Wear					
Soundness Loss					
Average Maximum Size					
% Retained on 2" Sieve					
Pit Average % Passing	Crushed to:				
	2"				
	1"				
	½"				
	No. 4				
	No. 10				
	No. 200				
Plasticity Index					

Remarks:

Pit Number		54104	5559	5580	5581
Location	Section	Not Sectionalized	N1/2 Sec. 32	NW1/4 Sec. 8	SE1/4 Sec. 7
	Township & Range	Navajo Indian Res.	16N 18W	16N 18W	15N 17W
	County	McKinley	McKinley	McKinley	McKinley
Formation		Qop	Kmf	Qp	
Rock Type		sand & gravel	burned shale	sand & gravel	sand & gravel
Source Rock (Gravel)				sandstone & limestone	
Quality of Material			poor	fair	
Thickness of Material		3-10'	75'	7'	8-11'
Thickness of Cap (Caliche)					
Material Underlying Formation		clay	sandstone & shale	shale & sandstone	shale
Vegetation			grass	sage	
Local Terrain			hilly	hill top	
Thickness of Overburden		1-5'		1-5'	2-13'
P. I. (Overburden)				11	
Estimated Quantity (cu. yds.)		60,000	10,000 plus	30,000	30,000
Los Angeles Wear		33.6		32.4	49.2
Soundness Loss			35.6		
Average Maximum Size			12"	3"	
% Retained on 2" Sieve			25	8	
Pit Average % Passing	Crushed to:			3/4"	3/4"
	2"				
	1"	(3/4")--100		100	(1/8")--100
	½"	88		90	93
	No. 4	54		64	64
	No. 10	37		48	47
	No. 200	6		11	7
Plasticity Index		N.P.		N.P.	N.P.

Remarks:

CONSTRUCTION MATERIALS INVENTORY

MATERIAL PIT SUMMARY

Pit Number		5612	5719	5866	5868
Location	Section	Not Sectionalized	Not Sectionalized	Not Sectionalized	NW1/4 Sec. 18
	Township & Range	Navajo Indian Res.	Navajo Indian Res.	Navajo Indian Res.	15N 16W
	County	McKinley	McKinley	McKinley	McKinley
Formation		Qop	Qop	Qal	Tru (owl rock membe-)
Rock Type		sand & gravel	sand & gravel	sand & gravel	limestone
Source Rock (Gravel)		sandstone & various	sandstone & various	sandstone & various	
Quality of Material		fair	fair	fair	poor
Thickness of Material		6'	1-10'	10' plus	5'
Thickness of Cap (Caliche)		1'	1'		
Material Underlying Formation		sandstone & shale	sandstone	sandstone	shale
Vegetation		grass	grass	grass	juniper, grass
Local Terrain		mesa top	mesa top	hilly	hilly
Thickness of Overburden		2'	1-3'	2'	1-4'
P. I. (Overburden)		6	7	8	6
Estimated Quantity (cu. yds)		75,000 plus	75,000 plus	150,000 plus	75,000 plus
Los Angeles Wear		43.6	43.8	42.8	27.2
Soundness Loss					14.4
Average Maximum Size		16"	16"	12"	
% Retained on 2" Sieve		30	30	35	
Pit Average % Passing	Crushed to:	as received	as received	as received	5/8"
	2"	72	62	63	
	1"	62	45	45	100
	½"	45	34	33	77
	No. 4	37	26	25	27
	No. 10	29	23	23	12
	No. 200	4	6	3	3
Plasticity Index		N.P.	N.P.	N.P.	N.P.
Remarks:					

Pit Number		5898	6034	634
Location	Section	SE1/4 Sec. 7	Not Sectionalized	Not Sectionalized
	Township & Range	15N 17W	Navajo Indian Res.	Navajo Indian Res.
	County	McKinley	McKinley	McKinley
Formation		Oal	Qp	Qop
Rock Type		sand & gravel	sand & gravel	sand & gravel
Source Rock (Gravel)		sandstone & limestone	sandstone & various	sandstone & various
Quality of Material		fair	fair	fair
Thickness of Material		10'	8'	9'
Thickness of Cap (Caliche)				
Material Underlying Formation		gravel	shale	shale & sandstone
Vegetation		grass	grass	grass
Local Terrain		hilly	hilly	mesa top
Thickness of Overburden		1'	1.5-6'	1-3'
P. I. (Overburden)		S.N.P.	6	S.N.P.
Estimated Quantity (cu. yds.)		50,000	100,000	100,000 plus
Los Angeles Wear		49.0	50.6	50.0
Soundness Loss		6.6	37.0	19.9
Average Maximum Size		2"	14"	12"
% Retained on 2" Sieve		1	45	40
Pit Average % Passing	Crushed to:	as received	as received	as received
	2"	100	59	61
	1"	98	46	48
	½"	96	38	37
	No. 4	89	27	29
	No. 10	81	20	25
	No. 200	7	3	3
Plasticity Index		N.P.	N.P.	N.P.
Remarks:				

CONSTRUCTION MATERIALS INVENTORY

MATERIAL PIT SUMMARY

Pit Number		6913
Location	Section	Not Sectionalized
	Township & Range	20N 17W
	County	McKinley
Formation		Qop
Rock Type		sand & gravel
Source Rock (Gravel)		sandstone
Quality of Material		poor
Thickness of Material		10'
Thickness of Cap (Caliche)		
Material Underlying Formation		sandstone & shale
Vegetation		grass
Local Terrain		mesa top
Thickness of Overburden		1-6'
P. I. (Overburden)		N.P.
Estimated Quantity (cu. yds)		150,000
Los Angeles Wear		48.4
Soundness Loss		
Average Maximum Size		10"
% Retained on 2" Sieve		40
Pit Average % Passing	Crushed to:	as received
	2"	63
	1"	51
	½"	43
	No. 4	36
	No. 10	33
	No. 200	4
Plasticity Index		N.P.

Remarks:

Pit Number		
Location	Section	
	Township & Range	
	County	
Formation		
Rock Type		
Source Rock (Gravel)		
Quality of Material		
Thickness of Material		
Thickness of Cap (Caliche)		
Material Underlying Formation		
Vegetation		
Local Terrain		
Thickness of Overburden		
P. I. (Overburden)		
Estimated Quantity (cu. yds.)		
Los Angeles Wear		
Soundness Loss		
Average Maximum Size		
% Retained on 2" Sieve		
Pit Average % Passing	Crushed to:	
	2"	
	1"	
	½"	
	No. 4	
	No. 10	
	No. 200	
Plasticity Index		

Remarks:

EXPLANATION

QUAD No. 26

QUATERNARY

- Qal — Alluvium
- Qe — Eolian deposits
- Qp — Pediment deposits

CRETACEOUS

- Kmf — Menefee Formation
- Kpl — Point Lookout Sandstone
- Kcc — Crevasse Canyon Formation
- Kg — Gallup Sandstone
- Km — Mancos Shale
- Kd — Dakota Sandstone

JURASSIC

- Jm — Morrison Formation
- Jzs — Zuni, Summerville, and/or Cow Springs Sandstone
- Jt — Todilto Formation
- Je — Entrada Formation

TRIASSIC

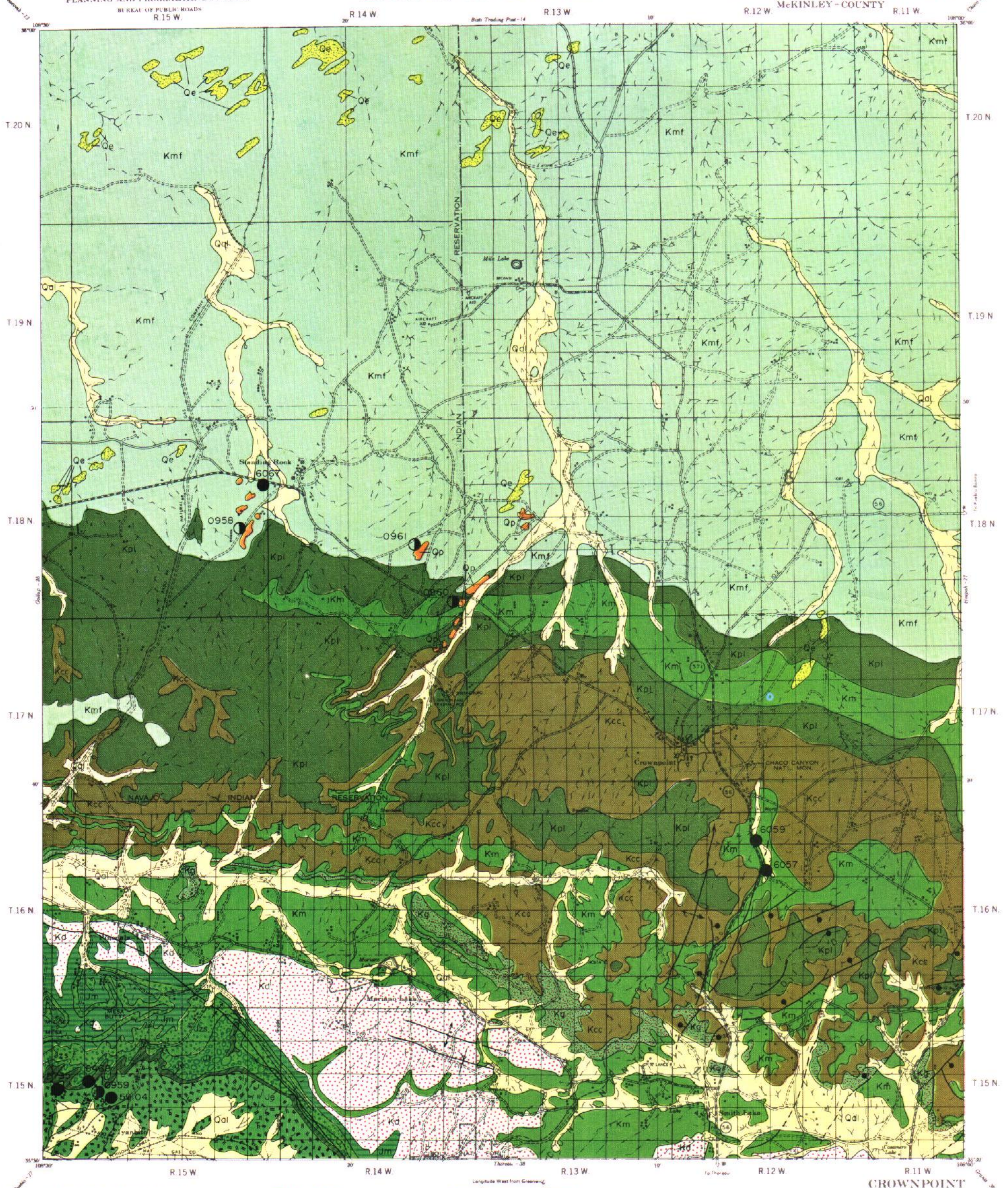
- R — Triassic rocks undivided

- Established pit or quarry
- Prospect pit or quarry
- Fault — downthrown side
- Anticline
- Syncline

NEW MEXICO STATE HIGHWAY DEPARTMENT
PLANNING AND PROGRAMMING DIVISION
BUREAU OF PUBLIC ROADS

GEOLOGY and AGGREGATE RESOURCES

CROWNPOINT QUADRANGLE - 26
McKINLEY-COUNTY



Control by U.S. Coast and Geodetic Survey, U.S. Geological Survey, U.S. Forest Service, Bureau of Land Management and Planning Division...Modified Conic Projection Standard Parallel 36½° North American Datum

DATE OF INVENTORY
GEOLOGY NOV. 1977

Longitude West from Greenwich
Scale 1/190080 or 1 Inch = 3 Miles

CROWNPOINT
QUADRANGLE
26

CONSTRUCTION MATERIALS INVENTORY

MATERIAL PIT SUMMARY

Pit Number		5735	59104	6057	6059
Location	Section	Not Sectionalized	Not Sectionalized	NE1/4 Sec. 16	SE1/4 Sec. 9
	Township & Range	Navajo Indian Res.	Navajo Indian Res.	16N 12W	16N 12W
	County	McKinley	McKinley	McKinley	McKinley
Formation		Qal	Qal	Qal	Qal
Rock Type		sand	fine sand & gravel	sand & gravel	sand & gravel
Source Rock (Gravel)		sandstone			baked shale & sandstone
Quality of Material		good			fair
Thickness of Material		3-5'	4-10'	12'	1-8'
Thickness of Cap (Caliche)					
Material Underlying Formation			clay		shale
Vegetation		cedar, juniper			grass
Local Terrain		hilly			hilly
Thickness of Overburden		1-7'			0-3'
P. I. (Overburden)					less than 6
Estimated Quantity (cu. yds)		60,000	25,000	100,000	50,000
Los Angeles Wear				46.8	46.0
Soundness Loss				28.0	3.6
Average Maximum Size		minus #4			1
% Retained on 2" Sieve		0			as received
Pit Average % Passing	Crushed to:	as received		as received	
	2"	100	100	100	100
	1"	93	96	96	89
	½"	85	89	86	
	No. 4	72	80	65	55
	No. 10	58	72	50	44
	No. 200	3	6	11	16
Plasticity Index		N.P.	N.P.	N.P.	N.P.
Remarks:					

Pit Number		6067	6469
Location	Section	Not Sectionalized	Not Sectionalized
	Township & Range	18N 15W	15N 15W 15N 15W
	County	McKinley	McKinley
Formation		Kmf	Jt
Rock Type		baked shale	limestone
Source Rock (Gravel)			
Quality of Material		fair	good
Thickness of Material		15'	4-8'
Thickness of Cap (Caliche)			
Material Underlying Formation		sandstone & shale	sandstone
Vegetation		grass	cedar & grass
Local Terrain		hilly	mesa
Thickness of Overburden		0-12'	0-10'
P. I. (Overburden)			N.P.
Estimated Quantity (cu. yds.)		30,000	unlimited
Los Angeles Wear		44.4	24
Soundness Loss		9.5	11.7
Average Maximum Size			
% Retained on 2" Sieve			
Pit Average % Passing	Crushed to:	1"	1"
	2"		
	1"	100	100
	½"	69	68
	No. 4	30	27
	No. 10	16	15
	No. 200	3	4
Plasticity Index		N.P.	N.P.

Remarks: Baked shale interbedded with stringers of shale, siltstone and sandstone.

EXPLANATION

QUAD No. 27

QUATERNARY

- Qal — Alluvium
- Qaa — Alluvial Aprons
- Qp — Pediment deposits

TERTIARY

- Ti — Intrusive rocks undivided
- TKoa — Ojo Alamo Formation

CRETACEOUS

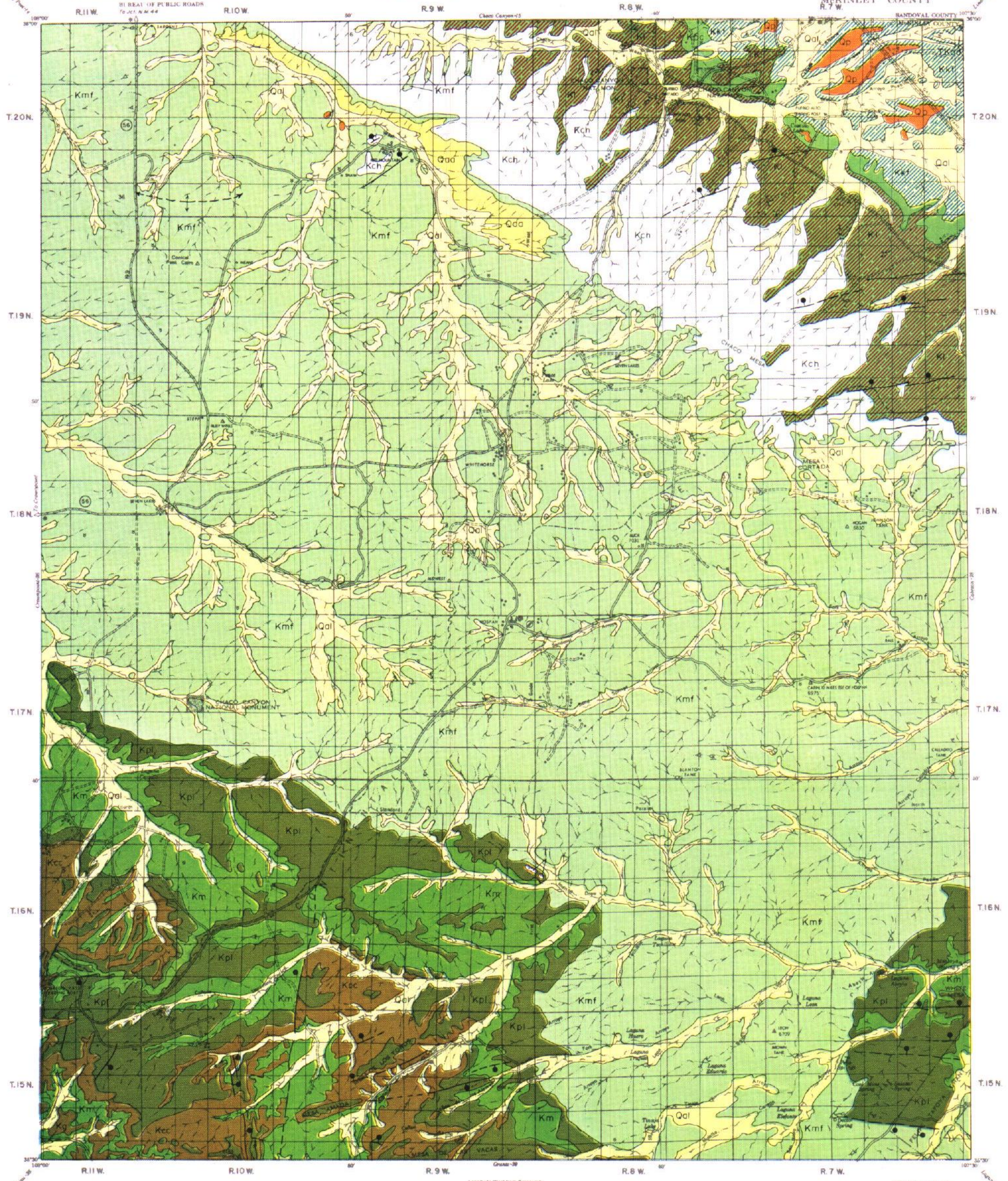
- Kkf — Kirtland-Fruitland Formations
- Kpc — Pictured Cliffs Sandstone
- Kl — Lewis Shale
- Kch — Cliff House Sandstone
- Kmf — Menefee Formation
- Kpl — Point Lookout Sandstone
- Kcc — Crevasse Canyon Formation
- Kg — Gallup Sandstone
- Km — Mancos Shale

- Established pit or quarry
- Prospect pit or quarry
- Fault — downthrown side
- Anticline
- Syncline

NEW MEXICO STATE HIGHWAY DEPARTMENT
PLANNING AND PROGRAMMING DIVISION
BUREAU OF PUBLIC ROADS

GEOLOGY and AGGREGATE RESOURCES

HOSPAH QUADRANGLE-27
McKINLEY COUNTY



Control by U.S. Coast and Geodetic Survey, U.S. Geological Survey, U.S. Forest Service, Bureau of Land Management and Planning Division—Modified Conic Projection Standard Parallel 34½° North American Datum

DATE OF INVENTORY
GEOLOGY NOV. 1977
AGGREGATE RESOURCES NOV. 1977

Longitude West from Greenwich
Scale 1/190080 or 1 Inch = 3 Miles
STATUTE MILES
1964

HOSPAH
QUADRANGLE
27

EXPLANATION

QUAD No. 28

QUATERNARY

- Qal — Alluvium
- Qaa — Alluvial Aprons
- Ql — Landslide Debris
- Qt — Terrace deposits (Post Glacial)
- Qp — Pediment deposits
- QTb — Basalt

TERTIARY

- Ti — Intrusive rocks undivided
- Tn — Nacimiento Formation
- Tsj — San Jose Formation
- TKoa — Ojo Alamo Formation

CRETACEOUS

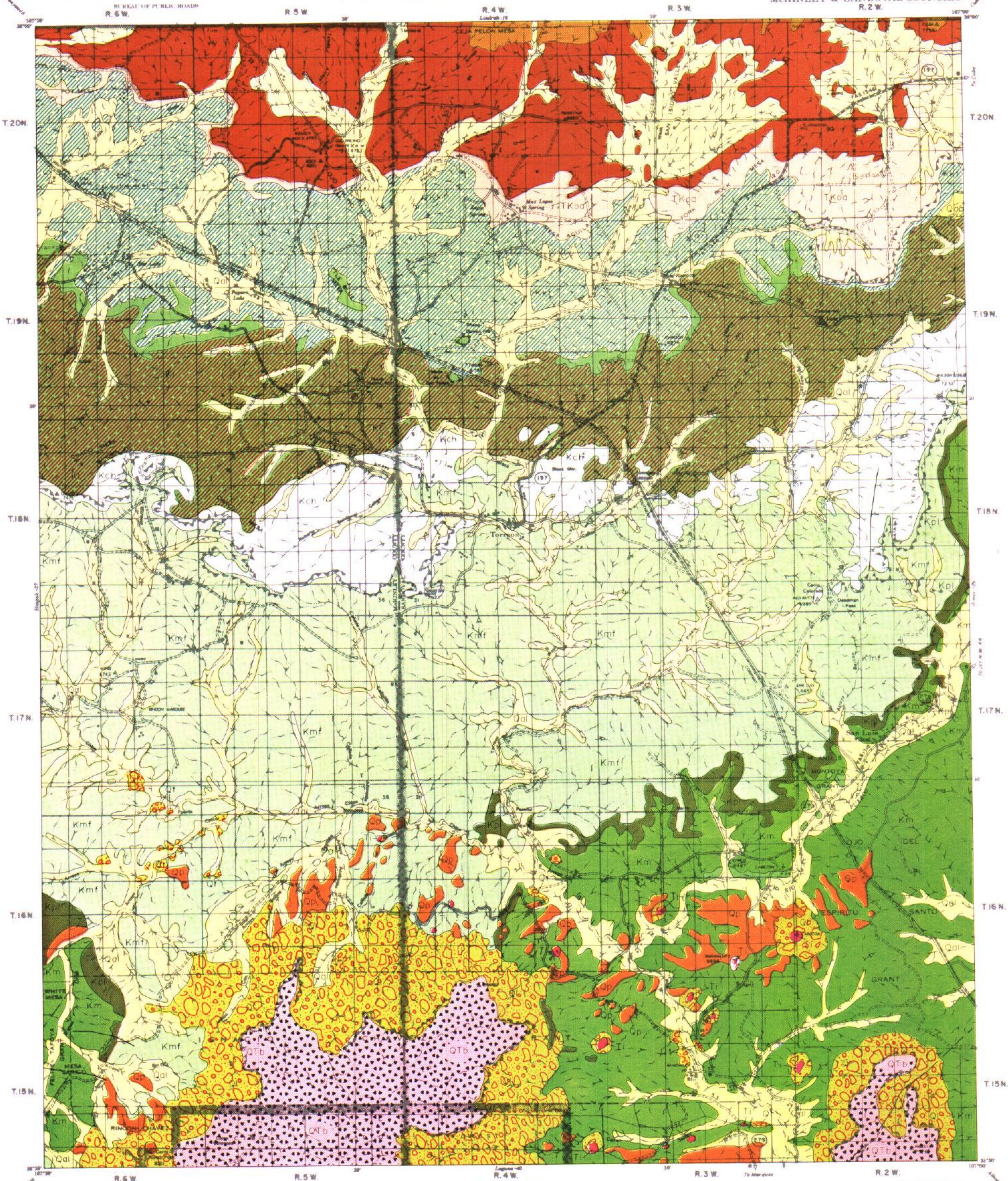
- Kkf — Kirtland-Fruitland Formations
- Kpc — Pictured Cliffs Sandstone
- Kl — Lewis Shale
- Kch — Cliff House Sandstone
- Kmf — Menefee Formation
- Kpl — Point Lookout Sandstone
- Km — Mancos Shale

- Established pit or quarry
- Prospect pit or quarry
- Fault — downthrown side
- Anticline
- Syncline

NEW MEXICO STATE HIGHWAY DEPARTMENT
PLANNING AND PROGRAMMING DIVISION
BUREAU OF PUBLIC ROADS

GEOLOGY and AGGREGATE RESOURCES

CABEZON QUADRANGLE-28
McKINLEY & SANDOVAL COUNTIES



Control by U.S. Coast and Geodetic Survey, U.S. Geological Survey, U.S. Forest Service, Bureau of Land Management and Planning Division—Modified Conic Projection Standard Parallel 36th° North American Datum

DATE OF INVENTORY
GEOLOGY JAN. 1978
AGGREGATE RESOURCES JAN. 1978

Scale or 1 Inch = 3 Miles

DATE OF INVENTORY
McKINLEY COUNTY 1964
SANDOVAL COUNTY 1961

CABEZON
QUADRANGLE
28

EXPLANATION

QUAD No. 29

QUATERNARY

- Qal — Alluvium
- Qaa — Alluvial Aprons
- Ql — Landslide Debris
- Qs — Spring deposits
- Qp — Pediment deposits
- Qip — Intermediate Pediment deposits
- Qt (1) — Terrace deposits (Post Glacial)
- Qb (1) — Basalt (Youngest or Undiff.)
- Qcf — Caldera fill
- Qrv — Valles Rhyolite
- Qrvc — El Cajele member of the Valles Rhyolite
- Qvt — Tuffaceous beds in Valle Grande Caldera
- Qbt — Bandelier Tuff
- QTsf — Santa Fe Formation
- Qrvr — Redonde Creek member of Valles Rhyolite
- Qaf — Alluvial fan deposits

TERTIARY

- Tb — Basalt
- Tt — Tschicoma Formation
- Tpa — Paliza Canyon Andesite
- Tc — Older Cinders
- TKoa — Ojo Alamo Formation

CRETACEOUS

- Kkf — Kirtland-Fruitland Formation
- Kl — Lewis Shale
- Kch — Cliff House Sandstone
- Kmf — Menefee Formation
- Kpl — Point Lookout Sandstone
- Kmv — Mesa Verde Group
- Km — Mancos Shale
- Kd — Dakota Sandstone

JURASSIC

- Jm — Morrison Formation
- Jt — Todilto Formation

JURASSIC TRIASSIC

- Je-Rc — Entrada-Chinle Formation undiff.

TRIASSIC

- Rc — Chinle Formation
- Ra — Aqua Zarca Sandstone

PERMIAN

- Py — Yeso Formation
- P — Lower Permian undivided
- Pa — Abo Formation

PENNSYLVANIAN

- ℙ — Pennsylvanian rock undivided
- p€q — Quartzite

PRECAMBRIAN

- p€ — Precambrian undivided

- Established pit or quarry
- Prospect pit or quarry
- Fault — downthrown side
- Anticline
- Syncline

NEW MEXICO STATE HIGHWAY DEPARTMENT

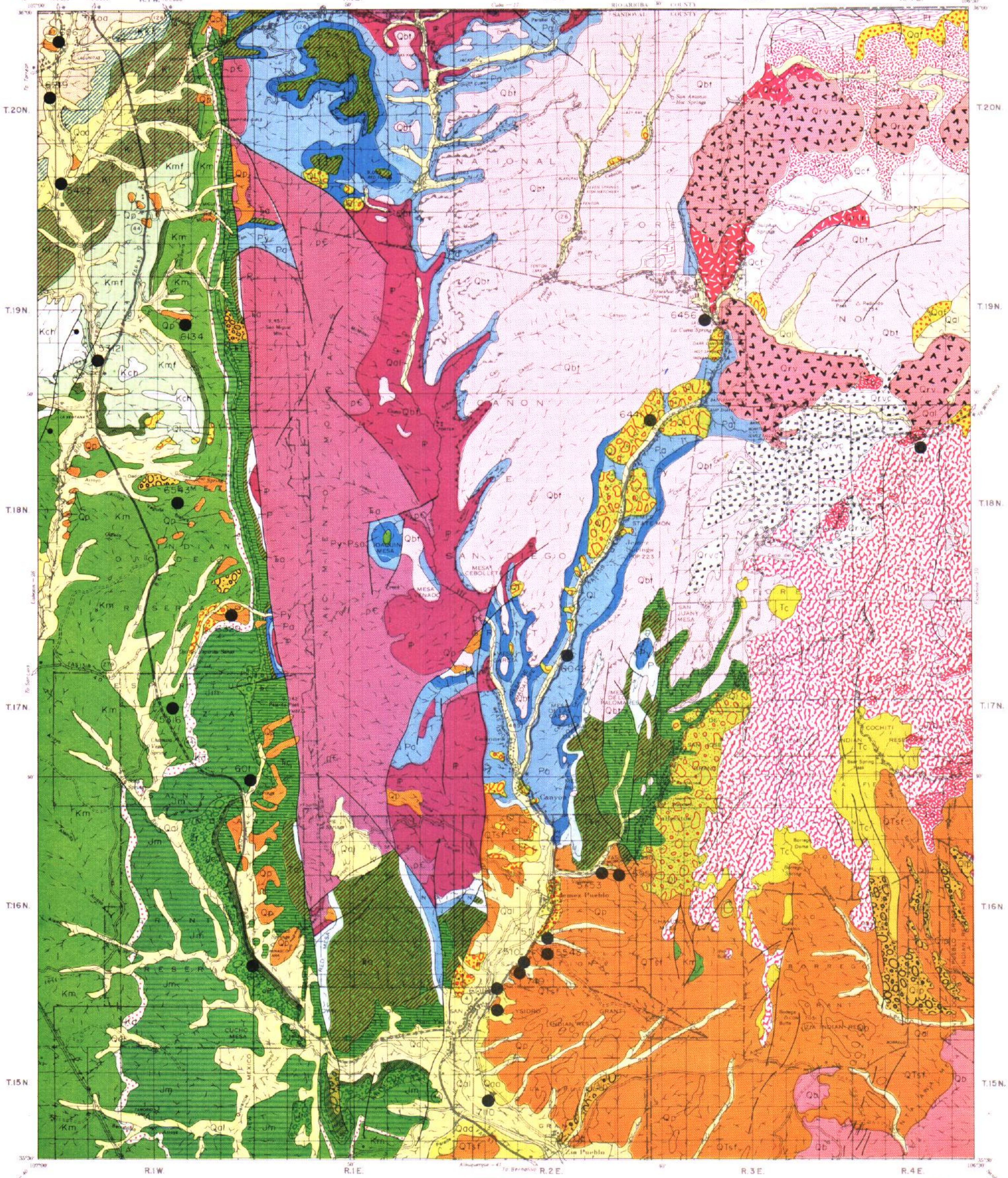
PLANNING AND PROGRAMMING DIVISION

BUREAU OF PUBLIC ROADS

GEOLOGY and AGGREGATE RESOURCES

JEMEZ QUADRANGLE – 29

RIO ARRIBA & SANDOVAL COUNTIES



Control by U.S. Coast and Geodetic Survey, U.S. Geological Survey, U.S. Forest Service, Bureau of Land Management and Planning Division. Modified Conic Projection Standard Parallel 34½° North American Datum

DATE OF INVENTORY

GEOLOGY NOV. 1977

Longitude West from Greenwich

Scale $\frac{1}{190080}$ or 1 Inch 3 Miles

DATE OF INVENTORY

RIO ARRIBA COUNTY 1959

SANDOVAL COUNTY 1961

JEMEZ

QUADRANGLE

29

CONSTRUCTION MATERIALS INVENTORY

MATERIAL PIT SUMMARY

Pit Number		5316	53121	5422	5543
Location	Section	Not Sectionalized	NW1/4 Sec. 29	NW1/4 Sec. 31	NW1/4 Sec. 28
	Township & Range	Espiritu Santo Grant	19N 1W	20N 1W	16N 2E
	County	Sandoval	Sandoval	Sandoval	Sandoval
Formation			Qal	Qal	Qp
Rock Type				sand & gravel	sand & gravel
Source Rock (Gravel)					
Quality of Material					
Thickness of Material					1-11'
Thickness of Cap (Caliche)					
Material Underlying Formation					sandstone
Vegetation					
Local Terrain					
Thickness of Overburden					0-7'
P. I. (Overburden)					
Estimated Quantity (cu. yds)				100,000	40,000
Los Angeles Wear				38.4	33.6
Soundness Loss					
Average Maximum Size					
% Retained on 2" Sieve					
Pit Average % Passing	Crushed to:				
	2"				3/4"
	1"				(3/4")--100
	½"				84
	No. 4				52
	No. 10				40
	No. 200				6
Plasticity Index					N.P.
Remarks:					

Pit Number		5753	5951	601	605
Location	Section	Section 11	S1/2 Sec. 11	Not Sectionalized	N1/2 Sec. 32
	Township & Range	16N 2E	16N 2E	Grant Ojo Del Espiritu Santo	16N 2E
	County	Sandoval	Sandoval	Sandoval	Sandoval
Formation		Qal	Qal	Qal	Qaa
Rock Type		sand & gravel	sand & gravel	sand & gravel	sand & gravel
Source Rock (Gravel)					
Quality of Material					
Thickness of Material		1-12'	4-13'	1-12'	1-8'
Thickness of Cap (Caliche)					
Material Underlying Formation		sand & gravel	sand & gravel	clay	sand
Vegetation					
Local Terrain					
Thickness of Overburden		1-4'	2-9'	1-?'	1-5'
P. I. (Overburden)		N.P.			
Estimated Quantity (cu. yds.)		50,000	60,000	100,000	50,000
Los Angeles Wear		33.2	40.0	39.2	29.6
Soundness Loss				6.3	5.3
Average Maximum Size					
% Retained on 2" Sieve					
Pit Average % Passing	Crushed to:	as received	as received	as received	as received
	2"	64	75	88	67
	1"	48	57	76	48
	½"	39	47	68	42
	No. 4	30	35	52	35
	No. 10	26	29	35	29
	No. 200	8	5	3	3
Plasticity Index		N.P.	N.P.	N.P.	N.P.
Remarks:					

CONSTRUCTION MATERIALS INVENTORY

QUADRANGLE PAGE 29(2)

MATERIAL PIT SUMMARY

Pit Number		606	6016	6017	6042
Location	Section	NW1/4 Sec. 6	Not Sectionalized	N1/2 Sec. 32	Not Sectionalized
	Township & Range	20N 1W	San Ysidro Grant	16N 2E	San Diego Grant
	County	Sandoval	Sandoval	Sandoval	Sandoval
Formation		Qal	Qaa	Qaa	Qal
Rock Type		sand & gravel	sand & gravel	sand	gravel
Source Rock (Gravel)					
Quality of Material					
Thickness of Material		3-11'	9.5'	0-3'	0-12'
Thickness of Cap (Caliche)					
Material Underlying Formation		sand & shale	clay	sand	gravel
Vegetation					
Local Terrain					
Thickness of Overburden		1-9'			
P. I. (Overburden)		12			
Estimated Quantity (cu. yds)		60,000	30,000	3,000	100,000
Los Angeles Wear		26.4	31.6		32.8
Soundness Loss		6.3			8.1
Average Maximum Size					
% Retained on 2" Sieve					
Pit Average % Passing	Crushed to:	as received	as received	as received	as received
	2"	88	79		49
	1"	80	62		26
	½"	70	50		17
	No. 4	53	39		2
	No. 10	33	30	100	11
	No. 200	5	2	13	1
Plasticity Index		5	N.P.	N.P.	N.P.

Remarks:

Pit Number		6219	636	6329
Location	Section	SE1/4 NW1/4 & NE1/4 SW1/4 Sec.	13 SW1/4 Sec. 30 SE1/4 Sec. 25	Not Sectionalized
	Township & Range	20N 2W	16N 1E & 16N 1W	Jemez Indian Res.
	County	Sandoval	Sandoval	Sandoval
Formation		Qal	Qal	Qal
Rock Type		gravel	sand & gravel	gravel
Source Rock (Gravel)				
Quality of Material				
Thickness of Material		1-12'	0-12'	1-13'
Thickness of Cap (Caliche)				
Material Underlying Formation		shale & sandy soil		shale & clay
Vegetation				
Local Terrain				
Thickness of Overburden		1-6'		1-6'
P. I. (Overburden)		N.P.	N.P.	N.P.
Estimated Quantity (cu. yds.)		30,000	5,000	375,000
Los Angeles Wear		27.2		32.8 (caliche-coated 42.4)
Soundness Loss		10.0		6.1
Average Maximum Size				
% Retained on 2" Sieve				
Pit Average % Passing	Crushed to:	as received	as received	as received
	2"	82		66
	1"	73		58
	½"	64	100	51
	No. 4	49	98	38
	No. 10	35	96	24
	No. 200	8	46	7
Plasticity Index		N.P.	N.P.	N.P.

Remarks:

CONSTRUCTION MATERIALS INVENTORY

MATERIAL PIT SUMMARY

Pit Number		6441	6456	6543	7110
Location	Section	Not Sectionalized	SW¼ Sec. 17	Not Sectionalized	SW¼ Sec. 17
	Township & Range	Canon de San Diego Grant	19N 3E	Ojo del Espiritu Grant	15N 2E
	County	Sandoval	Sandoval	Sandoval	Sandoval
Formation		Qal	Qal	Qal	Qal
Rock Type		gravel	sand & gravel	sand & gravel	sand & gravel
Source Rock (Gravel)					
Quality of Material					
Thickness of Material		5-40'	4-12'	10'	1-10'
Thickness of Cap (Caliche)					
Material Underlying Formation		soil & gravel	sand & gravel	shale	clay & silt
Vegetation			grass		
Local Terrain					
Thickness of Overburden		0-2'	1-8'	2-12'	1-7'
P. I. (Overburden)		N.P.	N.P.	N.P.	N.P.
Estimated Quantity (cu. yds)		40,000	25,000	125,000	250,000
Los Angeles Wear		26.0	35.2	42.0	23.6
Soundness Loss		9.6	28.0	10.6	7.7
Average Maximum Size					
% Retained on 2" Sieve					
Pit Average % Passing	Crushed to:	as received	as received	as received	as received
	2"	71	71	87	67
	1"	49	55	82	54
	½"	32	43	73	44
	No. 4	20	28	60	35
	No. 10	15	19	42	29
	No. 200	6	2	6	3
Plasticity Index		N.P.	N.P.	N.P.	N.P.
Remarks:					

Pit Number		744	749	7511
Location	Section	NW¼ Sec. 9	Section 32	SE¼ Sec. 21
	Township & Range	18N 4E	15N 2E	16N 2E
	County	Sandoval	Sandoval	Sandoval
Formation			Qal	Qal
Rock Type			sand & gravel	sand & gravel
Source Rock (Gravel)				
Quality of Material				
Thickness of Material				
Thickness of Cap (Caliche)				
Material Underlying Formation				
Vegetation				
Local Terrain				
Thickness of Overburden				
P. I. (Overburden)				
Estimated Quantity (cu. yds.)			90,000 plus	90,000 plus
Los Angeles Wear			26.2	25.8
Soundness Loss			8.0	4.8
Average Maximum Size				
% Retained on 2" Sieve				
Pit Average % Passing	Crushed to:		1"	1"
	2"			
	1"		100	100
	½"		76	90
	No. 4		47	57
	No. 10		35	44
	No. 200		5	5
Plasticity Index			N.P.	N.P.
Remarks:				

EXPLANATION

QUAD No. 30

QUATERNARY

- Qal — Alluvium
- Qaa — Alluvial Apron deposits
- Ql — Landslide debris
- Qab — Bolson deposits
- Qt_1 — Terrace deposits (Post Glacial)
- Qt_3 — Terrace deposits (Late Bull Lake)
- Qt_4 — Terrace deposits (Early Bull Lake)
- Qp — Pediment deposits
- Qrv — Valles Rhyolite
- Qop — Older Pediment deposits
- Qr — Rhyolite undifferentiated
- Qc — Cinders
- Qbt — Bandelier Tuff
- Qb_1 — Basalt
- Qb_2 — Basalt
- Qb_3 — Basalt
- QTg — Older Gravels

TERTIARY

- QTb — Basalt
- QTsf — Santa Fe Formation
- Tt — Tschicoma Formation
- Tpa — Paliza Canyon Andesite
- Tb — Basalt
- Trh — Rhyolite
- Tv — Volcanic rocks undivided
- Tes — Espinaso Volcanics
- Tm — Monzonite
- Tg — Galisteo Formation

JURASSIC CRETACEOUS

- Km — Mancos Shale
- Kd — Dakota Sandstone

JURASSIC

- J — Jurassic Rocks undivided

- Established pit or quarry
- Prospect pit or quarry
- Fault — downthrown side
- Anticline
- Syncline

NEW MEXICO STATE HIGHWAY DEPARTMENT
PLANNING AND PROGRAMMING DIVISION
BUREAU OF PUBLIC ROADS

GEOLOGY and AGGREGATE RESOURCES

ESPAÑOLA QUADRANGLE-30

RIO ARRIBA SANTA FE, SANDOVAL & LOS ALAMOS COUNTIES

R.4E. R.5E. R.6E. R.7E. R.8E. R.9E.

T.20 N. T.19 N. T.18 N. T.17 N. T.16 N. T.15 N.

Control by U.S. Coast and Geodetic Survey, U.S. Geological Survey, U.S. Forest Service, Bureau of Land Management and Planning Division—Modified Conic Projection Standard Parallel 36°, North American Datum

DATE OF INVENTORY
GEOLOGY FEB. 1975
AGGREGATE RESOURCES FEB. 1975

Scale 1/190,080 or 1 Inch = 3 Miles

DATE OF INVENTORY
LOS ALAMOS COUNTY 1960
RIO ARRIBA COUNTY 1959
SANDOVAL COUNTY 1961

ESPAÑOLA QUADRANGLE 30

CONSTRUCTION MATERIALS INVENTORY

MATERIAL PIT SUMMARY

Pit Number		5427	5429	5453	5480
Location	Section	SE 1/4 23	W 1/2 14	SW 1/4 32	SE 1/4 31
	Township & Range	16N 8E	15N 7E	17N 9E	17N 9E
	County	Santa Fe	Santa Fe	Santa Fe	Santa Fe
Formation		QTsf	Qc	Qal	Qt(2)
Rock Type		sand & gravel	cinders	sand & gravel	sand & gravel
Source Rock (Gravel)		granite & quartzite	-	granite & various	granite & various
Quality of Material		good	fair	good to excellent	good to fair
Thickness of Material		12' plus	85' plus	8' plus	9' plus
Thickness of Cap (Caliche)		-	0-1'	-	-
Material Underlying Formation		volcanics & silt	basalt	-	clay
Vegetation		grass	grass	sage	scattered juniper
Local Terrain		hilly	hill top	river bottom	hilly
Thickness of Overburden		0-3'	0-1'	0-3'	0-3'
P. I. (Overburden)		S.N.P.	N.P.	S.N.P.	S.N.P.
Estimated Quantity (cu. yds)		325,000 plus	100,000 plus	225,000 plus	300,000 plus
Los Angeles Wear		29.6	38.4	35.2	34.8
Soundness Loss		4.9	2.8	3.6	5.5
Average Maximum Size		5"	6"	5"	4"
% Retained on 2" Sieve		24	20	21	32
Pit Average % Passing	Crushed to:	as received	as received	as received	as received
	2"	96	95	95	80
	1"	84	70	88	64
	½"	69	52	76	55
	No. 4	51	20	61	44
	No. 10	39	8	47	33
	No. 200	5	1	2	7
Plasticity Index		N.P.	N.P.	N.P.	N.P.

Remarks:

Pit Number		54137	5568	5574	5629
Location	Section	NE 1/4 14	SW 1/4 18	SE 1/4 8	NE 1/4 12
	Township & Range	19N 8E	20N 9E	19N 9E	20N 8E
	County	Santa Fe	Santa Fe	Santa Fe	Santa Fe
Formation		QTsf	QTsf	QTsf	Qal
Rock Type		sand & gravel	sand & gravel	sand & gravel	sand & gravel
Source Rock (Gravel)		various	various	granite & quartzite	quartzite & various
Quality of Material		good	poor	good	excellent
Thickness of Material		10'	20' plus	13' plus	5' plus
Thickness of Cap (Caliche)		-	-	-	-
Material Underlying Formation		clay & silt	silt	silt	-
Vegetation		grass & scattered juniper	grass	grass	cottonwoods
Local Terrain		hilly	hilly	hilly	river bottom
Thickness of Overburden		0-3'	0-6'	0-4'	0-3'
P. I. (Overburden)		7	S.N.P.	7	S.N.P.
Estimated Quantity (cu. yds.)		350,000 plus	500,000 plus	150,000	275,000 plus
Los Angeles Wear		40.4	49.6	42.8	48.0
Soundness Loss		6.9	19.3	2.4	2.8
Average Maximum Size		8"	6"	4"	4"
% Retained on 2" Sieve		15	3	31	11
Pit Average % Passing	Crushed to:	as received	as received	as received	as received
	2"	62	94	66	71
	1"	53	78	56	54
	½"	43	73	45	40
	No. 4	29	68	34	30
	No. 10	18	64	26	22
	No. 200	3	15	8	2
Plasticity Index		N.P.	N.P.	N.P.	N.P.

Remarks:

54137: Material pits 54136 & 54138 nearby.

5629: Water at 3'.

CONSTRUCTION MATERIALS INVENTORY

MATERIAL PIT SUMMARY

Pit Number		5769	57107	58124	5909
Location	Section	not sectionalized	SE 1/4 15	SE 1/4 6	S 1/2 2
	Township & Range	Santa Fe Natl. Forest	19N 7E	19N 9E	16N 8E
	County	Los Alamos	Santa Fe	Santa Fe	Santa Fe
Formation		Qp	QTg	Qal	Qt(1)
Rock Type		gravel	sand & gravel	sand & gravel	sand & gravel
Source Rock (Gravel)		rhyolite	volcanics & various	granite & various	granite & various
Quality of Material		poor	excellent	good	excellent
Thickness of Material		20' plus	55'	10' plus	12' plus
Thickness of Cap (Caliche)		-	-	-	-
Material Underlying Formation		tuff	silt & tuff	-	clay
Vegetation		pine	scattered juniper	cottonwoods	grass & sage
Local Terrain		mountainous	mountainous	river bottom	river terrace
Thickness of Overburden		0-6'	0-5'	1'	5'
P. I. (Overburden)		10	S.N.P.	S.N.P.	8-N.P.
Estimated Quantity (cu. yds)		250,000 plus	375,000 plus	250,000 plus	250,000 plus
Los Angeles Wear		68.0	25.5	37.6	34.4
Soundness Loss		20.7	5.1	2.3	4.9
Average Maximum Size		-	10"	5"	6"
% Retained on 2" Sieve		-	33	18	36
Pit Average % Passing	Crushed to:	as received	as received	as received	as received
	2"	56	81	93	72
	1"	40	67	81	59
	½"	32	58	69	46
	No. 4	24	47	53	31
	No. 10	19	40	38	21
	No. 200	5	8	6	7
Plasticity Index		8	N.P.	N.P.	N.P.

Remarks:
58124: water at 4'
5909: water at 5'

Pit Number		6009	6032	6314	6318
Location	Section	SE 1/4 20 & NE 1/4 29	SW 1/4 5	SE 1/4 19	NW 1/4 8
	Township & Range	16N 6E	19N 9E	20N 8E	19N 9E
	County	Sandoval	Santa Fe	Rio Arriba	Santa Fe
Formation		Qt(3)	Qal	Qal	Qal
Rock Type		gravel	sand & gravel	sand & gravel	sand & gravel
Source Rock (Gravel)		various	granite & various	igneous	granite & quartzite
Quality of Material		excellent	good	excellent	excellent
Thickness of Material		23' plus	6' plus	11'	5' plus
Thickness of Cap (Caliche)		-	-	-	-
Material Underlying Formation		silt	silt	silt	-
Vegetation		grass & scattered juniper	grass & scattered juniper	juniper	cottonwood & willow trees
Local Terrain		hilly	river bottom	mountainous	river bottom
Thickness of Overburden		0-10'	0-4'	0-4'	0-2'
P. I. (Overburden)		6	S.N.P.	S.N.P.	S.N.P.
Estimated Quantity (cu. yds.)		350,000 plus	300,000 plus	250,000	15,000
Los Angeles Wear		30.0	38.4	36.4	38.9
Soundness Loss		2.35	4.7	6.4	4.7
Average Maximum Size		6"	3"	36"	3"
% Retained on 2" Sieve		30	10	15	10
Pit Average % Passing	Crushed to:	as received	as received	as received	as received
	2"	79	72	87	84
	1"	66	56	79	75
	½"	56	45	65	63
	No. 4	47	33	37	50
	No. 10	40	26	21	39
	No. 200	4	6	2	5
Plasticity Index		N.P.	N.P.	N.P.	N.P.

Remarks:
6032: water at 4'

CONSTRUCTION MATERIALS INVENTORY

MATERIAL PIT SUMMARY

Pit Number		6618	6621	6635	6717
Location	Section	S 1/2 26	SW 1/4 27	S 1/2 2	W 1/2 6
	Township & Range	15N 7E	16N 8E	20N 8E	19N 8E
	County	Santa Fe	Santa Fe	Rio Arriba-Santa Fe	Santa Fe
Formation		QTsf	QTsf	Qal	Qt(3)
Rock Type		sand & gravel	sand & gravel	sand & gravel	sand & gravel
Source Rock (Gravel)		various	granite & various	quartzite	volcanic & quartzite
Quality of Material		excellent	excellent	excellent	good
Thickness of Material		18'	9' plus	10'	15' plus
Thickness of Cap (Caliche)		-	-	-	-
Material Underlying Formation		silt & shale	silt & volcanics	clay	silt
Vegetation		juniper & grass	grass	cottonwood trees	grass & scattered juniper
Local Terrain		hilly	rolling	arroyo bottom	hilly
Thickness of Overburden		1-4'	0-2'	1'	0-3'
P. I. (Overburden)		9	7	N.P.	S.N.P.
Estimated Quantity (cu. yds)		375,000	250,000 plus	100,000	550,000 plus
Los Angeles Wear		24.0	32.0	36.4	24.8
Soundness Loss		11.9	4.4	2.7	3.2
Average Maximum Size		13"	3"	6"	12"
% Retained on 2" Sieve		5	18	18	25
Pit Average % Passing	Crushed to:	as received	as received	as received	as received
	2"	100	89	87	82
	1"	90	71	79	75
	½"	69	48	69	68
	No. 4	44	28	53	56
	No. 10	30	18	40	45
	No. 200	7	4	6	7
Plasticity Index		N.P.	N.P.	N.P.	N.P.

Remarks:
6635: water at 6'

Pit Number		6718	6813	6814	7018
Location	Section	SW 1/4 10	SW 1/4 1	SE 1/4 27	SW 1/4 6
	Township & Range	20N 8E	16N 8E	15N 8E	15N 8E
	County	Rio Arriba	Santa Fe	Santa Fe	Santa Fe
Formation		Qal	Qt(2)	Tm	Qt(2)
Rock Type		sand & gravel	sand & gravel	monzonite	sand & gravel
Source Rock (Gravel)		quartzite & igneous	granite & various	-	granite & quartzite
Quality of Material		excellent	excellent	good	good
Thickness of Material		5' plus	12' plus	11' plus	15' plus
Thickness of Cap (Caliche)		-	-	-	-
Material Underlying Formation		sand	silt	-	volcanics
Vegetation		grass	grass	juniper	scattered juniper
Local Terrain		river bank	rolling	hilly	hilly
Thickness of Overburden		5'	0-10'	1'	0-2'
P. I. (Overburden)		N.P.	15-N.P.	11	9
Estimated Quantity (cu. yds.)		775,000	250,000 plus	75,000 plus	125,000 plus
Los Angeles Wear		29.2	43.6	25.6	35.6
Soundness Loss		4.9	9.7	12.6	4.8
Average Maximum Size		11"	5"	-	3"
% Retained on 2" Sieve		27	18	-	15
Pit Average % Passing	Crushed to:	as received	as received	1"	as received
	2"	88	95	-	84
	1"	73	90	100	71
	½"	57	79	79	59
	No. 4	40	59	33	48
	No. 10	31	44	21	39
	No. 200	2	3	5	4
Plasticity Index		N.P.	N.P.	N.P.	N.P.

Remarks:
6718: water at 5'

MATERIAL PIT SUMMARY

Pit Number		0730	0731	0732	0733
Location	Section	SE 1/4 20	NW 1/4 23	NW 1/4 7	E 1/2 10
	Township & Range	20N 7E	19N 6E	18N 8E	19N 4E
	County	Rio Arriba	Los Alamos	Santa Fe	Sandoval
Formation		Qb	Qbt	Qb(3)	Qvr
Rock Type		pumice tuff	tuff	basalt	rhyolite
Source Rock (Gravel)		-	-	-	-
Quality of Material		fair	poor	fair	poor
Thickness of Material		10' plus	50' plus	100' plus	50' plus
Thickness of Cap (Caliche)		-	-	-	-
Material Underlying Formation		gravel & silt	-	-	tuff
Vegetation		juniper	pine	juniper	pine
Local Terrain		mountainous	mountainous	mountainous	mountainous
Thickness of Overburden		2-6'	0-3'	-	-
P. I. (Overburden)		S.N.P.	6-15	-	-
Estimated Quantity (cu. yds)		400,000	500,000 plus	600,000 plus	675,000 plus
Los Angeles Wear		41.3	95.3	22.0	86.7
Soundness Loss		-	100	1.2	-
Average Maximum Size		1"	-	-	-
% Retained on 2" Sieve		2	-	-	-
Pit Average % Passing	Crushed to:	as received	1"	1"	1"
	2"	100	-	-	-
	1"	99	100	100	100
	½"	81	69	51	80
	No. 4	14	39	23	42
	No. 10	6	29	14	39
	No. 200	3	7	3	4
Plasticity Index		N.P.	N.P.	N.P.	N.P.

Remarks:

Pit Number		0734	0735	0736	0737
Location	Section	not sectionalized	NE 1/4 3	not sectionalized	not sectionalized
	Township & Range	Baca Location No. 1	18N 4E	San Miguel Mountains	Jemez Indian Reservation
	County	Sandoval	Sandoval	Sandoval	Sandoval
Formation		Qr	Tb	Ta	Tr
Rock Type		rhyolite	basalt	andesite	rhyolite
Source Rock (Gravel)		-	-	-	-
Quality of Material		fair	good	good	fair
Thickness of Material		50' plus	45' plus	75' plus	20' plus
Thickness of Cap (Caliche)		-	-	-	-
Material Underlying Formation		tuff	tuff	tuff	-
Vegetation		pine	pine	pine	pine
Local Terrain		mountainous	mountainous	mountainous	mountainous
Thickness of Overburden		0-3'	-	0-3'	0-3'
P. I. (Overburden)		S.N.P.	-	N.P.-15	S.N.P.
Estimated Quantity (cu. yds.)		500,000 plus	300,000 plus	500,000 plus	375,000 plus
Los Angeles Wear		23.4	16.5	44.3	34.6
Soundness Loss		61.5	13.3	7.9	1.2
Average Maximum Size		-	-	-	-
% Retained on 2" Sieve		-	-	-	-
Pit Average % Passing	Crushed to:	1"	1"	1"	1"
	2"	-	-	-	-
	1"	100	100	100	100
	½"	55	49	65	57
	No. 4	22	20	33	22
	No. 10	12	11	21	11
	No. 200	2	3	5	1
Plasticity Index		N.P.	N.P.	N.P.	N.P.

Remarks:

CONSTRUCTION MATERIALS INVENTORY

MATERIAL PIT SUMMARY

Pit Number		0738	0739	0740	0741
Location	Section	not sectionalized	not sectionalized	not sectionalized	not sectionalized
	Township & Range	Jemez Indian Reservation	Caja del Rio Grant	La Bajada Grant	La Bajada Grant
	County	Sandoval	Sandoval	Santa Fe	Santa Fe
Formation		Tvu	Qa	Qb(1 & 2)	Qb(3)
Rock Type		basalt & other volcanics	basaltic andesite	basalt	basalt
Source Rock (Gravel)		-	-	-	-
Quality of Material		fair	good	good	good
Thickness of Material		20' plus	25' plus	25-50'	15'
Thickness of Cap (Caliche)		-	-	0-1'	0-1'
Material Underlying Formation		tuff	-	silt	silt & sandstone
Vegetation		pine	pinon & juniper	grass	grass
Local Terrain		mountainous	mountainous	mountainous	mountainous
Thickness of Overburden		0-2'	-	-	-
P. I. (Overburden)		S.N.P.	-	-	-
Estimated Quantity (cu. yds)		200,000 plus	600,000 plus	750,000 plus	600,000 plus
Los Angeles Wear		45.5	25.6	21.0	21.0
Soundness Loss		29.8	11.0	2.1	1.0
Average Maximum Size		-	-	-	-
% Retained on 2" Sieve		-	-	-	-
Pit Average % Passing	Crushed to:	1"	1 1/2"	1"	1"
	2"	-	100	-	-
	1"	100	51	100	100
	½"	68	25	57	54
	No. 4	33	15	24	25
	No. 10	21	10	14	14
	No. 200	7	4	3	3
Plasticity Index		N.P.	N.P.	N.P.	N.P.

Remarks:

Pit Number		0742	0743	0744
Location	Section	SW 1/4 32	not sectionalized	NW 1/4 20
	Township & Range	16N 8E	La Bajada Grant	15N 7E
	County	Santa Fe	Santa Fe	Santa Fe
Formation		Tm	Qp	Qp
Rock Type		monzonite	gravel	sand & gravel
Source Rock (Gravel)		-	volcanic & various	volcanic
Quality of Material		good	good	fair
Thickness of Material		40' plus	10'	5' plus
Thickness of Cap (Caliche)		-	-	-
Material Underlying Formation		-	silt	sandstone
Vegetation		scattered juniper	grass	grass
Local Terrain		hilly	rolling	hilly
Thickness of Overburden		-	0-2'	0-2'
P. I. (Overburden)		-	S.N.P.	S.N.P.
Estimated Quantity (cu. yds.)		350,000 plus	275,000 plus	75,000 plus
Los Angeles Wear		31.4	34.8	30.0
Soundness Loss		6.4	4.7	20.0
Average Maximum Size		-	4"	5"
% Retained on 2" Sieve		-	14	18
Pit Average % Passing	Crushed to:	1"	as received	as received
	2"	-	79	85
	1"	100	58	74
	½"	57	47	61
	No. 4	25	36	44
	No. 10	15	31	34
	No. 200	3	14	10
Plasticity Index		N.P.	N.P.	N.P.

Remarks:

EXPLANATION

QUAD No. 37

QUATERNARY

- Qal — Alluvium
- Qe — Eolian deposits
- Ql — Landslide Debris
- Qt — Terrace deposits (Post Glacial)
- Qp — Pediment deposits
- Qb — Basalt (Youngest or undiff.)
- Qop — Older Pediment deposits

TERTIARY

- Tu — Bidahochi Formation
- Ti — Intrusive rocks undivided

CRETACEOUS

- Kmf — Menefee Formation
- Kcc — Crevasse Canyon Formation
- Kg — Gallup Sandstone
- Km — Mancos Shale
- Kd — Dakota Sandstone

JURASSIC

- Jm — Morrison Formation
- Jzs — Zuni, Summerville, and/or Cow Springs Sandstone
- Jet — Entrada and Todilto undivided
- Jsr — San Rafael Group

TRAISSIC

- TR — Triassic rocks undivided

PENNSYLVANIAN

- Psa — San Andres Limestone
- Pg — Glorieta Sandstone
- Py — Yeso Formation
- Pa — Abo Formation

PRECAMBRIAN

- p€q — Quartzite

- Established pit or quarry
- Prospect pit or quarry
- Fault — downthrown side
- Anticline
- Syncline

NEW MEXICO STATE HIGHWAY DEPARTMENT
PLANNING AND PROGRAMMING DIVISION
BUREAU OF PUBLIC ROADS

GEOLOGY and AGGREGATE RESOURCES

ZUNI PUEBLO QUADRANGLE-37

McKINLEY COUNTY

R.21 W. R.20 W. R.19 W. R.18 W. R.17 W. R.16 W.

T.14 N. T.13 N. T.12 N. T.11 N. T.10 N. T.9 N.

ARIZONA

Control by U.S. Coast and Geodetic Survey; U.S. Geological Survey; U.S. Forest Service; Bureau of Land Management and Planning Division. Modified Conic Projection Standard Parallel 36°N° North American Datum

DATE OF INVENTORY
GEOLOGY JAN. 1978
AGGREGATE RESOURCES JAN. 1978

Longitude West from Greenwich

Scale 1/189790 or 1 inch = 3 Miles

STATUTE MILES

1964

ZUNI PUEBLO QUADRANGLE 37

CONSTRUCTION MATERIALS INVENTORY

MATERIAL PIT SUMMARY

Pit Number		4824	4825	4916	5023
Location	Section	Section 31	Section 31	Section 34	N1/2 Sec. 24
	Township & Range	15N 19W	15N 19W	15N 9W	12N 19W
	County	McKinley	McKinley	McKinley	McKinley
Formation					
Rock Type					
Source Rock (Gravel)					
Quality of Material					
Thickness of Material					
Thickness of Cap (Caliche)					
Material Underlying Formation					
Vegetation					
Local Terrain					
Thickness of Overburden					
P. I. (Overburden)					
Estimated Quantity (cu. yds)					
Los Angeles Wear					
Soundness Loss					
Average Maximum Size					
% Retained on 2" Sieve					
Pit Average % Passing	Crushed to:				
	2"				
	1"				
	½"				
	No. 4				
	No. 10				
	No. 200				
Plasticity Index					

Remarks:

Pit Number		5421	5737	5739	57101
Location	Section	SW1/4 NE1/4 Sec.6	Not Sectionalized	NW1/4 NW1/4 Sec.3	SE1/4 Sec. 31
	Township & Range	11N 18W	Ft. Wingate Military Res	14N 19W	10N 17W
	County	McKinley	McKinley	McKinley	McKinley
Formation		Qop	Psa	Ti	Km
Rock Type		sand & gravel	limestone	basalt	limestone
Source Rock (Gravel)		sandstone & various			
Quality of Material		fair	good	good	
Thickness of Material		16'	20' plus	225' plus	0-35'
Thickness of Cap (Caliche)					
Material Underlying Formation		sandstone	sandstone	sandstone	rock
Vegetation		pinon & cedar	pine	grass & juniper	
Local Terrain		hilly	mountainous	hilly	
Thickness of Overburden		0-3'			
P. I. (Overburden)					
Estimated Quantity (cu. yds.)		100,000 plus	100,000 plus	100,000 plus	40,000
Los Angeles Wear		38.0	45.6	16.4	37.6
Soundness Loss				3.4	
Average Maximum Size		6"			
% Retained on 2" Sieve		8			
Pit Average % Passing	Crushed to:		1"	1"	2"
	2"				100
	1"		100	100	48
	½"		61	62	21
	No. 4		26	34	11
	No. 10		16	26	7
	No. 200		2	6	1
Plasticity Index			N.P.	N.P.	N.P.

Remarks:

CONSTRUCTION MATERIALS INVENTORY

MATERIAL PIT SUMMARY

Pit Number		58121	6113	637	7116
Location	Section	SW1/4 Sec. 6	W1/2 Sec. 27	NW1/4 Sec. 11	SE1/4 Sec. 31
	Township & Range	10N 17W	13N 16W	9N 20W	10N 17W
	County	McKinley	McKinley	McKinley	McKinley
Formation		Qal	Psa	Qt	Ti
Rock Type		sand	limestone	sand & gravel	andesite
Source Rock (Gravel)				sandstone & various	
Quality of Material				fair	good
Thickness of Material		3'		12'	0-20'
Thickness of Cap (Caliche)					
Material Underlying Formation				clay, silt & sand	(shale) andesite
Vegetation			pine, pinon, grass	grass & juniper	grass
Local Terrain			hills	hilly	andesite plug
Thickness of Overburden				0-2	
P. I. (Overburden)				S.N.P.	
Estimated Quantity (cu. yds)			80,000	35,000	100,000
Los Angeles Wear			27.2	42.	26.6
Soundness Loss			1.8		9.0
Average Maximum Size				8"	
% Retained on 2" Sieve				8	
Pit Average % Passing	Crushed to:			as received	1 1/2"
	2"			95	(1 1/2")--100
	1"			82	79
	½"			71	28
	No. 4			44	11
	No. 10			27	6
	No. 200			6	2
Plasticity Index				2	N.P.
Remarks:					

Pit Number		7119
Location	Section	NE1/4 Sec. 17
	Township & Range	10N 18W
	County	McKinley
Formation		Qb
Rock Type		basalt
Source Rock (Gravel)		
Quality of Material		fair
Thickness of Material		10'
Thickness of Cap (Caliche)		
Material Underlying Formation		sand & shale
Vegetation		sage & juniper
Local Terrain		basalt flow
Thickness of Overburden		
P. I. (Overburden)		
Estimated Quantity (cu. yds.)		100,000
Los Angeles Wear		39.1
Soundness Loss		6.7
Average Maximum Size		
% Retained on 2" Sieve		
Pit Average % Passing	Crushed to:	1"
	2"	
	1"	
	½"	
	No. 4	
	No. 10	
	No. 200	
Plasticity Index		
Remarks:		

EXPLANATION

QUAD No. 38

QUATERNARY

- Qal — Alluvium
- Qg — Gravel deposits
- Qb_2 — Basalt (Intermediate)
- Qb_3 — Basalt (Oldest)
- Qc — Cinders and Scoria

TERTIARY

- Tb — Basalt

CRETACEOUS

- Kmv — Mesa Verde Group
- Km — Mancos Shale
- Kd — Dakota Sandstone

JURASSIC

- Jm — Morrison Formation
- Jzs — Zuni, Summerville, and/or Cow Springs Sandstone
- Jt — Todilto Formation
- Je — Entrada Formation
- Jet — Entrada and Todilto undivided

JURASSIC TRAISSIC

- JTrw — Wingate Sandstone

TRAISSIC

- Trc — Chinle Formation
- Psa — San Andres Limestone

PERMIAN

- Pg — Glorieta Sandstone
- Pyl — Yeso Limestone
- Py — Yeso Formation
- Pa — Abo Formation

PRECAMBRIAN

- p€m — Metamorphic rocks undivided
- p€mr — Metarhyolite
- p€a — Aplite
- p€g — Granite

- Established pit or quarry
- Prospect pit or quarry
- Fault — downthrown side
- Anticline
- Syncline

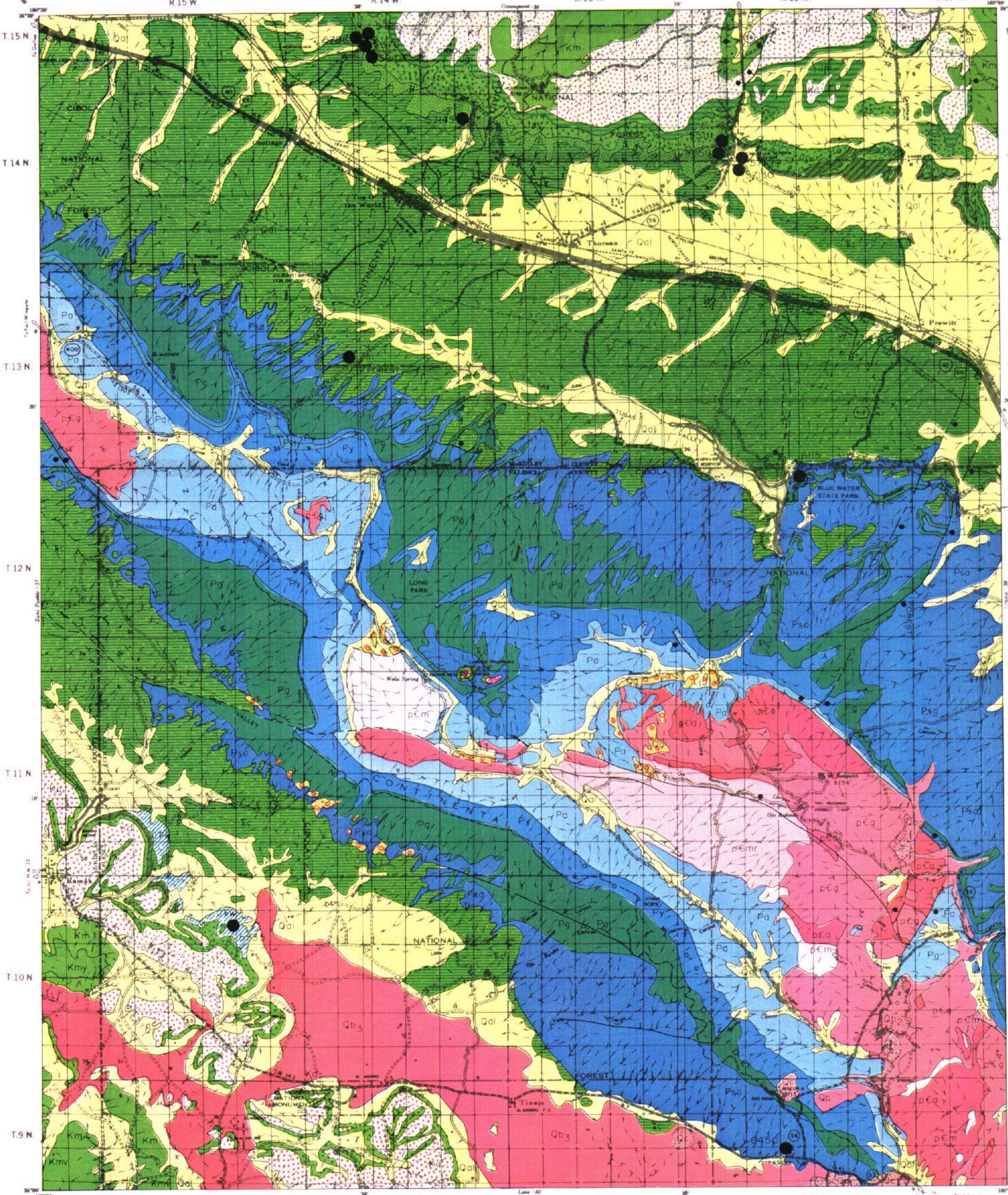
NEW MEXICO STATE HIGHWAY DEPARTMENT
PLANNING AND PROGRAMMING DIVISION
BUREAU OF PUBLIC ROADS

GEOLOGY and AGGREGATE RESOURCES

THOREAU QUADRANGLE 38
McKINLEY & VALENCIA COUNTIES

R.15 W. R.14 W. R.13 W. R.12 W. R.11 W.

T.15 N. T.14 N. T.13 N. T.12 N. T.11 N. T.10 N. T.9 N.



R 16 W R 15 W. R 14 W. R 13 W. R 12 W R 11 W.

Control by U.S. Coast and Geodetic Survey, U.S. Geological Survey, U.S. Forest Service, Bureau of Land Management and Planning Division - Modified Conic Projection Standard Parallel 39° North American Datum

DATE OF INVENTORY
GEOLOGY SEPT. 1977

Longitude West from Greenwich

Scale 1/126720 or 1 Inch = 3 Miles

DATE OF INVENTORY
McKINLEY COUNTY 1964
VALENCIA COUNTY 1962

THOREAU QUADRANGLE 38

CONSTRUCTION MATERIALS INVENTORY

MATERIAL PIT SUMMARY

Pit Number		5535	55111	5670	5722
Location	Section	NE¼ Sec. 10	NE¼ Sec. 18	Center Sec. 33	NW¼ Sec. 33
	Township & Range	10N 15W	14N 12W	15N 14W	15N 14W
	County	Valencia	McKinley	McKinley	McKinley
Formation		Trw	Jt	Jte	Jte
Rock Type		conglomerate	limestone	limestone	limestone
Source Rock (Gravel)		various			
Quality of Material		excellent	very good	very good	very good
Thickness of Material		15'	8'	5-9'	11'
Thickness of Cap (Caliche)					
Material Underlying Formation		siltstone	siltstone	sandstone	sandstone
Vegetation		pinon, juniper, grass	grass & pinon		
Local Terrain		sloping	top of scarp		
Thickness of Overburden		0-5'	0-5'	0-4'	
P. I. (Overburden)			N.P.		
Estimated Quantity (cu. yds)		100,000 plus	500,000 plus	200,000 plus	200,000 plus
Los Angeles Wear		22.4	20.4	24.	24.8
Soundness Loss		3.2	8.8		
Average Maximum Size		3"			
% Retained on 2" Sieve		3			
Pit Average % Passing	Crushed to:	as received	1"	2"	2"
	2"			100	100
	1"	100	100	47	47
	½"	80	64	19	21
	No. 4	45	24	9	9
	No. 10	26	12	6	5
	No. 200	9	3	2	1
Plasticity Index		N,P,	N,P,	N,P,	N.P.
Remarks:					

Pit Number		5723	5796	57109	57130
Location	Section	NW¼ Sec, 33	S½ of Sec, 33	SW¼ Sec, 17	NE¼ of NW¼ Sec. 20
	Township & Range	15N 14W	15N 14W	14N 12W	14N 12W
	County	McKinley	McKinley	McKinley	McKinley
Formation		Qal	Jte	Qal	Qal
Rock Type		sand	limestone	sand & gravel	sand & gravel
Source Rock (Gravel)					
Quality of Material			very good		
Thickness of Material			2-7'	1-12'	0-12'
Thickness of Cap (Caliche)					
Material Underlying Formation			sandstone		
Vegetation					
Local Terrain					
Thickness of Overburden			0-5'	0-2'	
P. I. (Overburden)			N.P.	N,P,	
Estimated Quantity (cu. yds.)			200,000 plus	100,000 plus	50,000 plus
Los Angeles Wear			24.4		68.
Soundness Loss					
Average Maximum Size					
% Retained on 2" Sieve					
Pit Average % Passing	Crushed to:		2"	as received	as received
	2"		100	84	100
	1"		87	71	94
	½"		83	64	89
	No. 4		77	51	81
	No. 10		73	40	73
	No. 200		23	3	3
Plasticity Index			10	N.P.	N,P,
Remarks:					

CONSTRUCTION MATERIALS INVENTORY

MATERIAL PIT SUMMARY

Pit Number		57145	58101	59103	6058
Location	Section	SE¼ Sec. 12	33	SW¼ Sec. 33	SE¼ of Sec. 18
	Township & Range	14N 14W	15N 14W	15N 14W	14N 12W
	County	McKinley	McKinley	McKinley	McKinley
Formation		Jte	Qal	Jt	Jte
Rock Type		limestone	sand	limestone	limestone
Source Rock (Gravel)					
Quality of Material				very good	
Thickness of Material				8'	10'
Thickness of Cap (Caliche)					
Material Underlying Formation		sandstone		siltstone	sandstone
Vegetation			grass	pinon & grass	grass & trees
Local Terrain				top of scarp	hills
Thickness of Overburden				0-8'	0-2.5'
P. I. (Overburden)				S.N.P.	
Estimated Quantity (cu. yds)		20,000		unlimited	50,000
Los Angeles Wear		30.		24.4	18.4
Soundness Loss		6.2		7.3	3.5
Average Maximum Size					
% Retained on 2" Sieve					
	Crushed to:	1"		1"	2"
	2"				100
Pit	1"	100		100	90
Average	½"	59		70	37
% Passing	No. 4	25		27	14
	No. 10	15		15	7
	No. 200	5		4	2
Plasticity Index		N.P.		N.P.	N.P.
Remarks:					

Pit Number		6115	6450	7111
Location	Section	SW¼ of NE¼ Sec. 4	NE¼ Sec. 16	SW¼ Sec. 16 & SE¼ Sec. 17
	Township & Range	12N 12W	9N 12W	13N 14W
	County	Valencia	Valencia	McKinley
Formation		Psa	Psa	Psa
Rock Type		limestone	limestone	limestone
Source Rock (Gravel)				
Quality of Material		very good	excellent	
Thickness of Material		12'	20'	
Thickness of Cap (Caliche)				
Material Underlying Formation		limestone & sandstone		
Vegetation		pinon & grass	pinon & pine	pine, pinon, cedar
Local Terrain		hilly	sloping	small hill side
Thickness of Overburden		0-6'	0-2'	
P. I. (Overburden)		10	N.P.	
Estimated Quantity (cu. yds.)		25,000	unlimited	75,000 plus
Los Angeles Wear		29.2	22.8	
Soundness Loss		0.7		
Average Maximum Size				
% Retained on 2" Sieve				
	Crushed to:	1"	1"	
	2"			
Pit	1"	100	100	
Average	½"	51	78	
% Passing	No. 4	22	30	
	No. 10	13	17	
	No. 200	5	4	
Plasticity Index		N.P.	N.P.	
Remarks:				

EXPLANATION

QUAD No. 39

QUATERNARY

- Qaf — Alluvium
- Qaa — Alluvial Aprons
- Qe — Eolian deposits
- Qp — Pediment deposits
- Ql — Landslide Debris
- Qs — Spring deposits
- Qb — Basalt (Youngest or undiff.)
- Qb_2 — Basalt (Intermediate)
- Qc — Cinders and Scoria
- QTb — Basalt

TERTIARY

- Ti — Intrusive rocks undivided
- Tc — Older Cinders
- Tv — Volcanic rocks undivided
- Trh — Rhyolite
- Kmf — Menefee Formation
- Kpl — Point Lookout Sandstone
- Kcc — Crevasse Canyon Formation

CRETACEOUS

- Kccm — Crevasse Canyon Fm. & Mancos Shale undivided
- Kg — Gallup Sandstone
- Kmv — Mesa Verde Group
- Km — Mancos Shale
- Kmth — Tres Hermanos S.S. Mbr. & Mancos Shale
- Kd — Dakota Sandstone

JURASSIC

- Jm — Morrison Formation
- J — Jurassic rocks undivided
- Jet — Entrada and Todilto undivided

TRAISSIC

- Ru — Upper Triassic rocks (inc. Chinle)

PERMIAN

- Psa — San Andres Limestone
- Pg — Glorieta Sandstone
- Py — Yeso Formation
- Pa — Abo Formation

PRECAMBRIAN

- pCg — Granite

- Established pit or quarry
- Prospect pit or quarry
- Fault — downthrown side
- Anticline
- Syncline

NEW MEXICO STATE HIGHWAY DEPARTMENT

PLANNING AND PROGRAMMING DIVISION

BUREAU OF PUBLIC ROADS

GEOLOGY and AGGREGATE RESOURCES

GRANTS QUADRANGLE - 39

McKINLEY & VALENCIA COUNTIES

R.11 W. R.10 W. R.9 W. R.8 W. R.7 W.

T.15 N. T.14 N. T.13 N. T.12 N. T.11 N. T.10 N. T.9 N.

Control by U.S. Coast and Geodetic Survey, U.S. Geological Survey, U.S. Forest Service, Bureau of Land Management and "Planning Division - Modified Conic Projection Standard Parallel 34½° North American Datum"

DATE OF INVENTORY

GEOLOGY DEC. 1977

AGGREGATE RESOURCES DEC. 1977

Longitude West from Greenwich

Scale 1/126720 or 1 Inch = 3 Miles

STATUTE MILES

DATE OF INVENTORY

McKINLEY COUNTY 1964

VALENCIA COUNTY 1962

INTERSTATE REVISED 8-67

GRANTS QUADRANGLE 39

CONSTRUCTION MATERIALS INVENTORY

MATERIAL PIT SUMMARY

Pit Number		5132	5133	5134	5281
Location	Section	Section 28	SE¼ Sec. 17	Section 21	SE¼ Sec. 3
	Township & Range	10N 10W	11N 9W	10N 10W	11N 11W
	County	Valencia	Valencia	Valencia	Valencia
Formation		Qal	Qal	Qal	Qal
Rock Type		sand & gravel	sand & gravel	sand & gravel	sand & gravel
Source Rock (Gravel)					
Quality of Material					
Thickness of Material					
Thickness of Cap (Caliche)					
Material Underlying Formation					
Vegetation					
Local Terrain					
Thickness of Overburden					
P. I. (Overburden)					
Estimated Quantity (cu. yds)					
Los Angeles Wear					
Soundness Loss					
Average Maximum Size					
% Retained on 2" Sieve					
Pit Average % Passing	Crushed to:				
	2"				
	1"				
	½"				
	No. 4				
	No. 10				
	No. 200				
Plasticity Index					

Remarks:

Pit Number		53108	53110	543
Location	Section	Section 27	Section 25	NW¼ of SW¼ of Sec. 21 NE¼ of SE¼ Sec. 20
	Township & Range	12N 9W	12N 10W	10N 10W
	County	Valencia	Valencia	Valencia
Formation		Qal	Qp	Qal
Rock Type		sand & gravel	sand & gravel	sand & gravel
Source Rock (Gravel)				
Quality of Material				
Thickness of Material				
Thickness of Cap (Caliche)				
Material Underlying Formation				
Vegetation				
Local Terrain				
Thickness of Overburden				
P. I. (Overburden)				
Estimated Quantity (cu. yds.)				
Los Angeles Wear				
Soundness Loss				
Average Maximum Size				
% Retained on 2" Sieve				
Pit Average % Passing	Crushed to:			
	2"			
	1"			
	½"			
	No. 4			
	No. 10			
	No. 200			
Plasticity Index				

Remarks:

CONSTRUCTION MATERIALS INVENTORY

MATERIAL PIT SUMMARY

Pit Number		5411	5425	54115	54121
Location	Section	NE¼ Sec. 22	E½ Sec. 33	29	NE¼ Sec. 4
	Township & Range	10N 7W	10N 10W	11N 10W	11N 10W
	County	Valencia	Valencia	Valencia	Valencia
Formation		Qal	Qal	Psa	Qal
Rock Type		sand & gravel	sand & gravel	limestone	sand
Source Rock (Gravel)					
Quality of Material					
Thickness of Material		0-12'			
Thickness of Cap (Caliche)					
Material Underlying Formation					
Vegetation		mesquite		grass	
Local Terrain		hilly		hill	
Thickness of Overburden		0-2'			
P. I. (Overburden)		N.P.			
Estimated Quantity (cu. yds)		200,000	50,000 plus	unlimited	50,000 plus
Los Angeles Wear		16.0	45.		
Soundness Loss		2.6			
Average Maximum Size					
% Retained on 2" Sieve					
Pit Average % Passing	Crushed to:	as received			
	2"	93			
	1"	84			
	½"	75			
	No. 4	48			
	No. 10	25			
	No. 200	3			
Plasticity Index		N.P.			

Remarks:

Pit Number		5518		5536		5558	56113
Location	Section	NW¼ of SW¼ Sec. 32		NW¼ Sec. 36 & SW¼ Sec 25		SE¼ Sec. 3 & NE¼ Sec 10	NE¼ Sec. 31
	Township & Range	12N 10W		12N 11W		11N 11W	13N 9W
	County	Valencia		Valencia		Valencia	McKinley
Formation		Psa		Qal		Psa	Jet
Rock Type		limestone		sand & gravel		limestone	limestone
Source Rock (Gravel)							
Quality of Material							
Thickness of Material				0-13' plus		0-12' plus	0-14' plus
Thickness of Cap (Caliche)							
Material Underlying Formation				silt & sand			sandstone & shale
Vegetation		grass					
Local Terrain		hill					
Thickness of Overburden				0-18'		0-1'	0-9'
P. I. (Overburden)						9	
Estimated Quantity (cu. yds.)		unlimited		75,000		unlimited	200.000 plus
Los Angeles Wear				42.4		32.8	22.4
Soundness Loss							1.2
Average Maximum Size							
% Retained on 2" Sieve							
Pit Average % Passing	Crushed to:			as received		3/4"	2"
	2"						100
	1"		(3/4")	100	(3/4")	100	46
	½"			87		66	22
	No. 4			56		28	9
	No. 10			44		15	5
	No. 200			6		3	N.P.
Plasticity Index				N.P.		6	

Remarks:

CONSTRUCTION MATERIALS INVENTORY

MATERIAL PIT SUMMARY

Pit Number		5771	5783	57108	57127
Location	Section	SW¼ Sec. 2	Section 29	SW¼ Sec. 25	25
	Township & Range	10N 8W	11N 10W	12N 11W	12N 10W
	County	Valencia	Valencia	Valencia	Valencia
Formation		Qal		Qal	Qal
Rock Type		sand & gravel		gravel	sand & fine gravel
Source Rock (Gravel)					
Quality of Material					
Thickness of Material		0-11'			
Thickness of Cap (Caliche)					
Material Underlying Formation		shale			
Vegetation		cedar & grass			grass
Local Terrain					hills
Thickness of Overburden		0-9'			
P. I. (Overburden)					
Estimated Quantity (cu. yds)		80,000		50,000 plus	60,000
Los Angeles Wear		27.8			
Soundness Loss		10.3			
Average Maximum Size					
% Retained on 2" Sieve					
	Crushed to:	as received			
	2"	58			
Pit	1"	45			
Average	½"	37			
% Passing	No. 4	29			
	No. 10	23			
	No. 200	7			
Plasticity Index		N.P.			
Remarks:					

Pit Number		58114	5925	6052	6116
Location	Section	Not Sectionalized	Section 3	Section 11	Not Sectionalized
	Township & Range	San Mateo Springs Grant	10N 8W	10N 8W	Cubero Grant 10N 6 1
	County	Valencia	Valencia	Valencia	Valencia
Formation		Qp	Qal	Qp	Qal
Rock Type		sand & gravel	sand & gravel	sand & gravel	sand & gravel
Source Rock (Gravel)					
Quality of Material					
Thickness of Material		3-9'			
Thickness of Cap (Caliche)					
Material Underlying Formation		clay & shale			
Vegetation					
Local Terrain					
Thickness of Overburden		0-3'			
P. I. (Overburden)					
Estimated Quantity (cu. yds.)		100,000 plus			
Los Angeles Wear		38.			
Soundness Loss					
Average Maximum Size					
% Retained on 2" Sieve					
	Crushed to:	as received			
	2"	82			
Pit	1"	65			
Average	½"	49			
% Passing	No. 4	35			
	No. 10	29			
	No. 200	6			
Plasticity Index		N.P.			
Remarks:					

MATERIAL PIT SUMMARY

Pit Number		6118	6123	6451	6527
Location	Section	NW¼ Sec 25 NE¼ Sec 21	SW¼ NW¼ Sec. 25	SE¼ Sec. 20	Section 31
	Township & Range	10N 8W	10N 8W	11N 9W	13N 9W
	County	Valencia	Valencia	Valencia	McKinley
Formation		Qal	Qal	Jet	
Rock Type		sand & gravel	sand & gravel	limestone	
Source Rock (Gravel)					
Quality of Material					
Thickness of Material		5-13'	11'		
Thickness of Cap (Caliche)					
Material Underlying Formation			sandstone		
Vegetation		grass & juniper			
Local Terrain		terrace			
Thickness of Overburden		0-10'	0-3'		
P. I. (Overburden)		11	11		
Estimated Quantity (cu. yds)		75,000	25,000	100,000 plus	
Los Angeles Wear		24.4	21.6	22.	
Soundness Loss		4.1	3.6	9.	
Average Maximum Size					
% Retained on 2" Sieve					
Pit Average % Passing	Crushed to:	as received	as received	2"	
	2"	75	66	100	
	1"	55	50	82	
	½"	38	38	29	
	No. 4	22	27	22	
	No. 10	16	20	12	
	No. 200	4	4	3	
Plasticity Index		8	N.P.	N.P.	

Remarks:

Pit Number		6729	6730	6731
Location	Section	Section 36	SE¼ Sec. 3 NE¼ Sec. 10	SE¼ Sec. 20
	Township & Range	12N 11W	11N 11W	11N 10W
	County	Valencia	Valencia	Valencia
Formation		Psa	Psa	Psa
Rock Type		limestone	limestone	limestone
Source Rock (Gravel)				
Quality of Material				
Thickness of Material			0-13'	0-10'
Thickness of Cap (Caliche)				
Material Underlying Formation			sandstone	sandstone
Vegetation			cedar & pinon	cedar & grass
Local Terrain			ls ridge	ls ridge
Thickness of Overburden			0-2'	0-1'
P. I. (Overburden)			8	N.P.
Estimated Quantity (cu. yds.)			unlimited	75,000
Los Angeles Wear			31.4	17.2
Soundness Loss			2.2	4.8
Average Maximum Size				
% Retained on 2" Sieve				
Pit Average % Passing	Crushed to:		2"	2"
	2"		100	100
	1"		75	76
	½"		35	32
	No. 4		14	15
	No. 10		7	9
	No. 200		2	2
Plasticity Index			N.P.	N.P.

Remarks:

EXPLANATION

QUAD No. 40

QUATERNARY

- Qal — Alluvium
- Qaa — Alluvial Aprons
- Qe — Eolian deposits
- Ql — Landslide Debris
- Qt — Terrace deposits (Post Glacial)
- Qp — Pediment deposits
- Qb — Basalt (Youngest to undiff.)
- Qop — Older Pediment deposits
- Qtsf — Santa Fe Formation
- QTc — Older Scoria and Cinders in cones
- QTb — Basalt

TERTIARY

- Ti — Intrusive rocks undivided

CRETACEOUS

- Kmf — Menefee Formation
- Kmu — Upper Mancos Shale (inc. Satan Tongue)
- Kpl — Point Lookout Sandstone
- Kcc — Crevasse Canyon Formation
- Kg — Gallup Sandstone
- Km — Mancos Shale
- Kd — Dakota Sandstone

JURASSIC

- Jm — Morrison Formation
- Jbs — Bluff and Summerville Formation
- Jet — Entrada and Todilto undivided

TRAISSIC

- R — Triassic rocks undivided

- Established pit or quarry
- Prospect pit or quarry
- Fault — downthrown side
- Anticline
- Syncline

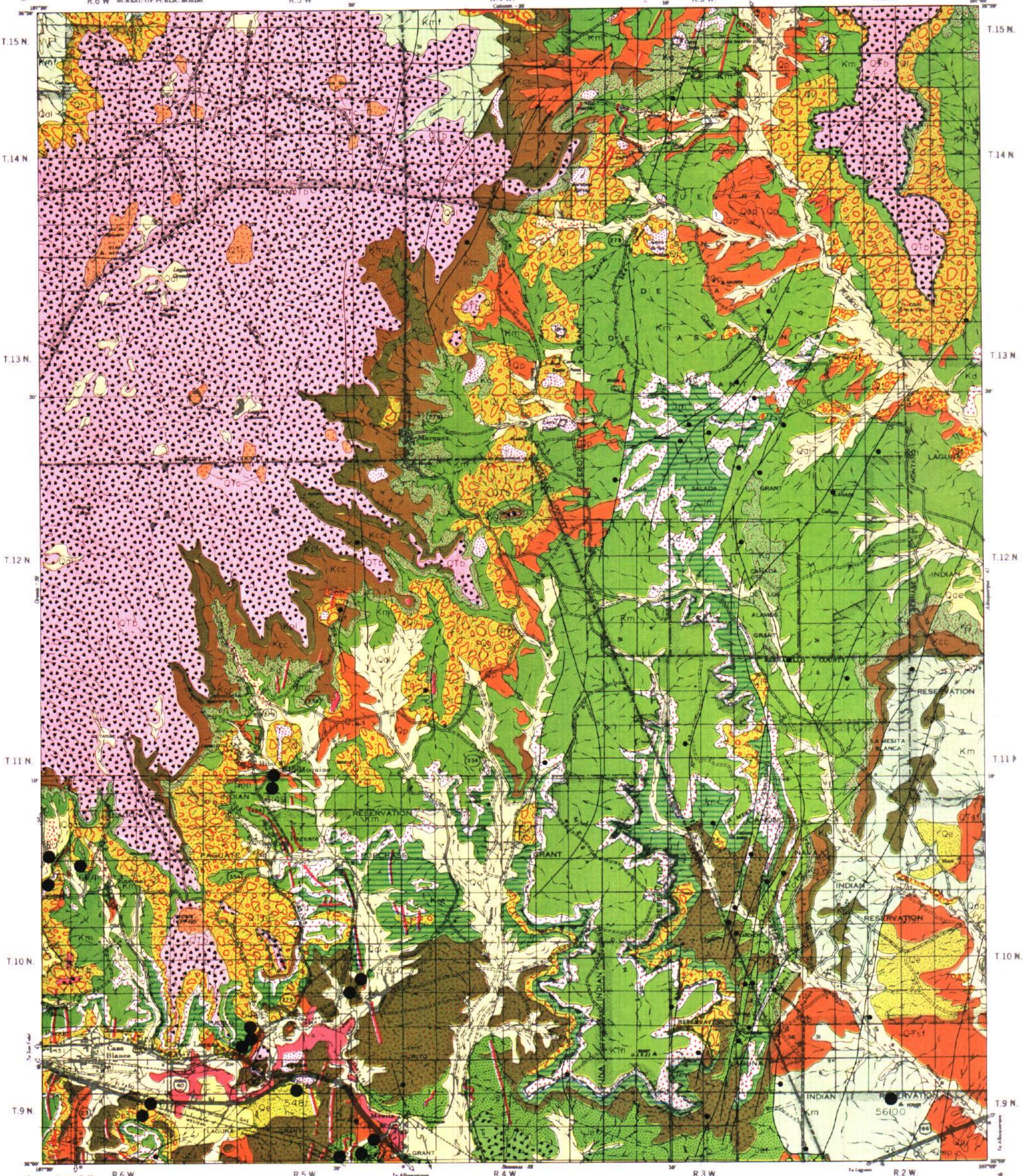
NEW MEXICO STATE HIGHWAY DEPARTMENT

PLANNING AND PROGRAMMING DIVISION

GEOLOGY and AGGREGATE RESOURCES

LAGUNA QUADRANGLE–40

BERNALILLO SANDOVAL McKINLEY & VALENCIA COUNTIES



Control by U.S. Coast and Geodetic Survey; U.S. Geological Survey; U.S. Forest Service; Bureau of Land Management and Planning Division—Modified Conic Projection Standard Parallel 36°0' North American Datum

DATE OF INVENTORY

GEOLOGY OCT. 1977

AGGREGATE RESOURCES OCT. 1977

Longitude West from Greenwich

Scale 1/190080 or 1 Inch = 3 Miles

STATUTE MILES

DATE OF INVENTORY	
BERNALILLO COUNTY	1964
McKINLEY COUNTY	1964
SANDOVAL COUNTY	1961
VALENCIA COUNTY	1962
INTERSTATE REVISED	8-67

LAGUNA QUADRANGLE

CONSTRUCTION MATERIALS INVENTORY

MATERIAL PIT SUMMARY

Pit Number		502	53107	5416	5466
Location	Section	Section 32	SE¼ Sec. 23	W½ Sec 13 E½ Sec 14	SW¼ Sec. 32
	Township & Range	10N 5W	10N 5W	9N 5W	10N 5W
	County	Valencia	Valencia	Valencia	Valencia
Formation				Qp	Q1
Rock Type				sand & gravel	sand & gravel
Source Rock (Gravel)					
Quality of Material					
Thickness of Material					2-13'
Thickness of Cap (Caliche)					
Material Underlying Formation					clay & gravel
Vegetation					
Local Terrain					
Thickness of Overburden					0-9'
P. I. (Overburden)					9
Estimated Quantity (cu. yds)				40,000	50,000
Los Angeles Wear				49.2	26.4
Soundness Loss					
Average Maximum Size					
% Retained on 2" Sieve					
Pit Average % Passing	Crushed to:				as received
	2"				68
	1"				48
	½"				37
	No. 4				29
	No. 10				23
	No. 200				7
Plasticity Index					10

Remarks:

Pit Number		5481	56100	5766	5777
Location	Section	SW¼ Sec. 4	Not Sectionalized	E½ Sec. 4	S½ Sec. 14
	Township & Range	9N 5W	Antonio Sadillo Grant	9N 5W	9N 5W
	County	Valencia	Bernalillo	Valencia	Valencia
Formation		Qe	Kmf (Qal)	Qal	Jet
Rock Type		sand	pea gravel & sand	sand & gravel	limestone
Source Rock (Gravel)					
Quality of Material					
Thickness of Material		10'	6-12'	3-13'	
Thickness of Cap (Caliche)					
Material Underlying Formation			sand & gravel	sand & gravel	
Vegetation					grass & trees
Local Terrain					bluffs
Thickness of Overburden			1-5'	0-8'	
P. I. (Overburden)			N.P.		
Estimated Quantity (cu. yds.)		100,000 plus	100,000	18,000	100,000 plus
Los Angeles Wear			30.4	46.	
Soundness Loss					
Average Maximum Size					
% Retained on 2" Sieve					
Pit Average % Passing	Crushed to:		as received	as received	
	2"		100	100	
	1"		97	90	
	½"		92	75	
	No. 4		78	53	
	No. 10		66	40	
	No. 200		1	3	
Plasticity Index			N.P.	N.P.	

Remarks:

CONSTRUCTION MATERIALS INVENTORY

MATERIAL PIT SUMMARY

Pit Number		6114	6116	6117	6131
Location	Section	E½ of SW¼ Sec. 33	SW¼ Sec. 5	Section 32	SW¼ of SW¼ Sec 1 NW¼ Sec. 12
	Township & Range	11N 6W	10N 6W	11N 6W	9N 6W
	County	Valencia	Valencia	Valencia	Valencia
Formation		Qls	Qls	Qal	Qls
Rock Type		gravel	gravel	gravel	sand & gravel
Source Rock (Gravel)					
Quality of Material					
Thickness of Material		0-15'			0-12'
Thickness of Cap (Caliche)					
Material Underlying Formation		silt, soil & gravel			clay & sand
Vegetation		greesewood			
Local Terrain		arroyo			
Thickness of Overburden		1-12'			2-13'
P. I. (Overburden)					
Estimated Quantity (cu. yds)		200,000			85,000
Los Angeles Wear		31.6			37.6
Soundness Loss		5.6			20.9
Average Maximum Size					
% Retained on 2" Sieve					
Pit Average % Passing	Crushed to:	as received			as received
	2"	68			86
	1"	59			74
	½"	51			61
	No. 4	40			43
	No. 10	32			29
	No. 200	8			4
Plasticity Index		3			N.P.

Remarks:

Pit Number		6135	6149	6150	6230
Location	Section	NE¼ of NW¼ Sec. 12	SE¼ Sec. 21	NE¼ of SW¼ & NW¼ of SE¼ Sec. 21	Section 32
	Township & Range	9N 6W	11N 5W	11N 5W	10N 5W
	County	Valencia	Valencia	Valencia	Valencia
Formation		Qaa	Qop	Qop	
Rock Type		sand & gravel	sand & gravel	sand & gravel	
Source Rock (Gravel)					
Quality of Material					
Thickness of Material		3-8'	3-10'		
Thickness of Cap (Caliche)					
Material Underlying Formation		clay & sand	sandstone & shale		
Vegetation			grass & juniper	grass & juniper	
Local Terrain					
Thickness of Overburden		3-11'	1-10'		
P. I. (Overburden)		N.P.	15		
Estimated Quantity (cu. yds.)		65,000 plus	160,000	60,000 plus	
Los Angeles Wear		37.6	20.8		
Soundness Loss		20.9	6.8		
Average Maximum Size					
% Retained on 2" Sieve					
Pit Average % Passing	Crushed to:	as received	as received		
	2"	93	78		
	1"	83	67		
	½"	72	54		
	No. 4	60	39		
	No. 10	51	28		
	No. 200	8	5		
Plasticity Index		N.P.	N.P.		

Remarks:

CONSTRUCTION MATERIALS INVENTORY

MATERIAL PIT SUMMARY

Pit Number		6232
Location	Section	SE¼ Sec. 23 & NE¼ Sec. 26
	Township & Range	10N 5W
	County	Valencia
Formation		Qal
Rock Type		sand & gravel
Source Rock (Gravel)		
Quality of Material		0-12'
Thickness of Material		
Thickness of Cap (Caliche)		
Material Underlying Formation		sandstone
Vegetation		
Local Terrain		
Thickness of Overburden		0-11'
P. I. (Overburden)		N.P.
Estimated Quantity (cu. yds)		60,000 plus
Los Angeles Wear		30.8
Soundness Loss		9.6
Average Maximum Size		
% Retained on 2" Sieve		
	Crushed to:	as received
	2"	77
Pit	1"	58
Average	½"	46
% Passing	No. 4	34
	No. 10	24
	No. 200	5
Plasticity Index		N.P.
Remarks:		

Pit Number		
Location	Section	
	Township & Range	
	County	
Formation		
Rock Type		
Source Rock (Gravel)		
Quality of Material		
Thickness of Material		
Thickness of Cap (Caliche)		
Material Underlying Formation		
Vegetation		
Local Terrain		
Thickness of Overburden		
P. I. (Overburden)		
Estimated Quantity (cu. yds.)		
Los Angeles Wear		
Soundness Loss		
Average Maximum Size		
% Retained on 2" Sieve		
	Crushed to:	
	2"	
Pit	1"	
Average	½"	
% Passing	No. 4	
	No. 10	
	No. 200	
Plasticity Index		
Remarks:		

EXPLANATION

QUAD No. 41

QUATERNARY

- Qal — Alluvium
- Qaa — Alluvial Aprons
- Qaf — Alluvial fan deposits
- Qe — Eolian deposits
- Ql — Landslide Debris
- Qp — Pediment deposits
- Qc — Cinders and Scoria
- Qb — Basalt (Youngest or undiff.)
- Qb_2 — Basalt (Intermediate)
- Qt — Terrace deposits (Post Glacial)
- Qip — Intermediate Pediment deposits
- Qr — Rhyolite undifferentiated
- Qb_3 — Basalt (Oldest)
- Qop — Older Pediment deposits
- Qg — Gravel deposits
- QTi — Intrusives
- QTsf — Santa Fe Formation

TERTIARY

- Tg — Galisteo Formation

CRETACEOUS

- Kmv — Mesa Verde Group
- Kg — Gallup Sandstone
- Km — Mancos Shale
- Kd — Dakota Sandstone

JURASSIC

- Jm — Morrison Formation

PRECAMBRIAN

- p€m — Metamorphic rocks undivided

- Established pit or quarry
- Prospect pit or quarry
- Fault — downthrown side
- Anticline
- Syncline

NEW MEXICO STATE HIGHWAY DEPARTMENT

PLANNING AND PROGRAMMING DIVISION

BUREAU OF PUBLIC ROADS

GEOLOGY and AGGREGATE RESOURCES

ALBUQUERQUE QUADRANGLE – 41

BERNALILLO & SANDOVAL COUNTIES

R.1W. R.1E. R.2E. R.3E. R.4E.

T.15N. T.14N. T.13N. T.12N. T.11N. T.10N. T.9N.

Control by U.S. Coast and Geodetic Survey, U.S. Geological Survey, U.S. Forest Service, Bureau of Land Management and Planning Division. Modified Conic Projection Standard Parallel 34°, North American Datum

DATE OF INVENTORY

GEOLOGY - NOV. 1977

AGGREGATE RESOURCES - NOV. 1977

Longitude West from Greenwich

Scale 1/126720 or 1 Inch = 3 Miles

STATUTE MILES

DATE OF INVENTORY

BERNALILLO COUNTY 1964

SANDOVAL COUNTY 1951

ALBUQUERQUE QUADRANGLE 41

CONSTRUCTION MATERIALS INVENTORY

MATERIAL PIT SUMMARY

Pit Number		4876	5077	5387	5389
Location	Section	Not Sectionalized	Not Sectionalized	Not Sectionalized	Not Sectionalized
	Township & Range	11N 3E	10N 2E	9N 1W Alb. Grant	9N 1W
	County	Bernalillo	Bernalillo	Bernalillo	Bernalillo
Formation		Qt	Qt	Qt	Qaa
Rock Type		sand & gravel	sand & gravel	sand & gravel	sand
Source Rock (Gravel)					
Quality of Material					
Thickness of Material					
Thickness of Cap (Caliche)					
Material Underlying Formation					
Vegetation					
Local Terrain					
Thickness of Overburden					
P. I. (Overburden)					
Estimated Quantity (cu. yds)					
Los Angeles Wear					
Soundness Loss					
Average Maximum Size					
% Retained on 2" Sieve					
Pit Average % Passing	Crushed to:				
	2"				
	1"				
	½"				
	No. 4				
	No. 10				
	No. 200				
Plasticity Index					
Remarks:					

Pit Number		53127	546	5410	5413
Location	Section	Not Sectionalized	Not Sectionalized	S½ Sec. 2	N½ Sec. 18
	Township & Range	9N 1W	Atrisco Grant	11N 3E	12N 4E
	County	Bernalillo	Bernalillo	Bernalillo	Sandoval
Formation		Qtsf	Qaa	Qt	Qt
Rock Type		sand & gravel	sand & gravel	sand & gravel	sand & gravel
Source Rock (Gravel)				various	various
Quality of Material				excellent	
Thickness of Material				20'	20' plus
Thickness of Cap (Caliche)					
Material Underlying Formation					silt & sand
Vegetation				grass	grass
Local Terrain			hill	terrace	hills
Thickness of Overburden				3'	
P. I. (Overburden)				11	
Estimated Quantity (cu. yds.)		23,000	20,000	100,000 plus	500,000 plus
Los Angeles Wear				27,6	24.0
Soundness Loss				13.7	2.2
Average Maximum Size				6"	6"
% Retained on 2" Sieve					10
Pit Average % Passing	Crushed to:			3/4"	as received
	2"				89
	1"			100	76
	½"		(3/4")	88	68
	No. 4			51	58
	No. 10			40	50
	No. 200			22	3
Plasticity Index				10	N.P.
Remarks:					

CONSTRUCTION MATERIALS INVENTORY

QUADRANGLE PAGE 41(2)

MATERIAL PIT SUMMARY

Pit Number		5433	5487	5488	5489
Location	Section	Not Sectionalized	Not Sectionalized	Not Sectionalized	NW¼ of SE¼ Sec. 27 S½ of NE¼ Sec. 27
	Township & Range	9N 2E	10N 4E	11N 3E	11N 2E
	County	Bernalillo	Bernalillo	Bernalillo	Bernalillo
Formation		Qt	Qt	Qt	Qt_2
Rock Type		sand & gravel	sand & gravel	sand & gravel	sand & gravel
Source Rock (Gravel)		various	various	various	
Quality of Material		fair to good	excellent	excellent	
Thickness of Material		10-15' plus	20'	20'	6-9'
Thickness of Cap (Caliche)					
Material Underlying Formation			sand	sand	sand
Vegetation		grass	grass	grass	grass
Local Terrain		flat	open pit mine	open pit mine	gravel terrace
Thickness of Overburden		2.4	5-20	5-20	0-1.6'
P. I. (Overburden)		5	S.N.P.	S.N.P.	N.P.
Estimated Quantity (cu. yds)		50,000	100,000 plus	100,000	50,000
Los Angeles Wear		24.4	26.4	26.4	25.2
Soundness Loss		1.4	1.4	1.4	
Average Maximum Size		3"	6"	6"	
% Retained on 2" Sieve		1	15	15	
Pit Average % Passing	Crushed to:	as received	as received	as received	3/4"
	2"	95	87	87	
	1"	10	78	78	(3/4") 100
	½"	62	59	59	82
	No. 4	45	43	43	49
	No. 10	33	37	37	39
	No. 200	3	4	4	4
Plasticity Index		N.P.	N.P.	N.P.	N.P.

Remarks:

Pit Number		5490	5492	5493	5495
Location	Section	S½ Sec. 14	Section 26	SE¼ Sec. 27	Not Sectionalized
	Township & Range	11N 2E	11N 3E	10N 4E	Gutierrez Land Grant
	County	Bernalillo	Bernalillo	Bernalillo	Bernalillo
Formation		Qt_2	Qt	Qip	Qip
Rock Type		sand & gravel	sand & gravel	sand & gravel	sand & gravel
Source Rock (Gravel)		various	various		
Quality of Material		very good	excellent		
Thickness of Material		15' plus	20' plus		
Thickness of Cap (Caliche)					
Material Underlying Formation			sand		
Vegetation		grass	grass		
Local Terrain		gravel knoll	open pit mine		
Thickness of Overburden			5-20'		
P. I. (Overburden)			S.N.P.		
Estimated Quantity (cu. yds.)		60,000 plus	500,000 plus	40,000 plus	50,000
Los Angeles Wear		27.2	26.4	28.4	28.8
Soundness Loss		3.79	1.4		
Average Maximum Size		8	6"		
% Retained on 2" Sieve		15-25	15		
Pit Average % Passing	Crushed to:	as received	as received		
	2"	88	87		
	1"	67	78		
	½"	48	59		
	No. 4	33	43		
	No. 10	27	37		
	No. 200	3	4		
Plasticity Index		N.P.	N.P.		

Remarks:

CONSTRUCTION MATERIALS INVENTORY

MATERIAL PIT SUMMARY

Pit Number		5510	5511	5512	5513
Location	Section	SE¼ 34, SW¼ 35	N½	Not Sectionalized	Not Sectionalized
	Township & Range	10N 2E	9N 1W	Atrisco Grant 9N 1W	9N 1W
	County	Bernalillo	Bernalillo	Bernalillo	Bernalillo
Formation		Qt	Qt	Qb3	Qr
Rock Type		sand & gravel	sand & gravel	basalt	cinder & rhyolite
Source Rock (Gravel)		various	various		
Quality of Material		excellent	very good	excellent	excellent
Thickness of Material		6-9'	15'	15'	40' plus
Thickness of Cap (Caliche)					
Material Underlying Formation		sand & gravel	siltstone	sandstone	
Vegetation		grass	grass	grass	grass
Local Terrain		terrace	hill	sloping mesa	hill
Thickness of Overburden		1-6'			
P. I. (Overburden)					
Estimated Quantity (cu. yds)		200,000 plus	200,000	500,000 plus	200,000 plus
Los Angeles Wear		25.6	24.4	20.0	29.6
Soundness Loss		2.0	8.6	5.9	4.4
Average Maximum Size		4"	2"		
% Retained on 2" Sieve			2		
Pit Average % Passing	Crushed to:	3/4"	as received	3/4"	1"
	2"		100		
	1"	(3/4") 100	97 (3/4")	100	100
	½"	82	90	77 (3/4")	88
	No. 4	95	68	24	21
	No. 10	33	47	13	13
	No. 200	3	2	3	4
Plasticity Index		N.P.	N.P.	N.P.	N.P.

Remarks:

Pit Number		5514	5537	5538	6023
Location	Section	Not Sectionalized	Not Sectionalized	Not Sectionalized	Not Sectionalized
	Township & Range	Atrisco Grant 9N 1W	Atrisco Grant 9N 1W	Atrisco Grant 9N 1W	Atrisco Grant
	County	Bernalillo	Bernalillo	Bernalillo	Bernalillo
Formation		Qtsf	Qt	Qb3	Qt
Rock Type		coarse sand	sand & gravel	basalt	sand & gravel
Source Rock (Gravel)			various		various
Quality of Material			very good		fair to good
Thickness of Material			0-13'	6'	6-14'
Thickness of Cap (Caliche)					
Material Underlying Formation			sand, silt clay	sandstone	sandy soil
Vegetation		grass	grass & sage	grass	grass
Local Terrain		hills	terraces	sloping mesa	flat
Thickness of Overburden					0-13'
P. I. (Overburden)					N.P.
Estimated Quantity (cu. yds.)		50,000	60,000 plus	50,000	200,000
Los Angeles Wear			28.8	21.6	25.6
Soundness Loss			16.1	2.0	1.4
Average Maximum Size			3"		3
% Retained on 2" Sieve			5		1
Pit Average % Passing	Crushed to:		3/4"	3/4"	as received
	2"				95
	1"	(3/4")	100 (3/4")	100	80
	½"		95	86	62
	No. 4		81	36	45
	No. 10		69	18	33
	No. 200		5	3	0
Plasticity Index			N.P.	N.P.	N.P.

Remarks:

CONSTRUCTION MATERIALS INVENTORY

MATERIAL PIT SUMMARY

Pit Number		5691	5692	5696	5725
Location	Section	N½ Sec. 18	S½ Sec. 15	Not Sectionalized	SE¼ Sec. 27
	Township & Range	12N 4E	13N 4E	Sandia Indian Pueblo	10N 4E
	County	Sandoval	Sandoval	Bernalillo	Bernalillo
Formation		Qt	Qt	Qt	Qal
Rock Type		sand & gravel	sand & gravel	sand & gravel	sand
Source Rock (Gravel)		various	various	various	
Quality of Material			very good	excellent	
Thickness of Material		20' plus	20'	20'	12'
Thickness of Cap (Caliche)					
Material Underlying Formation		silt & sand	sand & gravel		
Vegetation		grass	juniper & grass	grass	
Local Terrain		hills	hilly	terraces	
Thickness of Overburden			0-6'	0-5'	0-1'
P. I. (Overburden)			10	7	N.P.
Estimated Quantity (cu. yds)		500,000 plus	400,000 plus	500,000 plus	200,000
Los Angeles Wear		24.0	25.6	27.6	32.0
Soundness Loss		2.2	3.2	8.0	
Average Maximum Size		6"	5"	6"	
% Retained on 2" Sieve		10	25	10	97
Pit Average % Passing	Crushed to:	as received	as received	as received	as received
	2"	89	78	73	97
	1"	76	42	53	89
	½"	68	23	38	84
	No. 4	58	12	27	68
	No. 10	50	10	21	43
	No. 200	3	1	1	3
Plasticity Index		N.P.	N.P.	N.P.	N.P.

Remarks:

Pit Number		58127	602	603	6060
Location	Section	Section 4	NW¼ Sec. 4	S½ Sec. 4	Section 4
	Township & Range	10N 3E	9N 3E	9N 3E	10N 3E
	County	Bernalillo	Bernalillo	Bernalillo	Bernalillo
Formation		Qt	Qg	Qg	
Rock Type		sand & gravel	sand & minor gravel	sand & minor gravel	
Source Rock (Gravel)			various	various	
Quality of Material			fair	fair	
Thickness of Material		11-38'	10-15'	8-13'	
Thickness of Cap (Caliche)					
Material Underlying Formation		sand & gravel	sandy siltstone	sandy siltstone	
Vegetation			grass	grass	
Local Terrain				hilly	
Thickness of Overburden		0	2-16'	0-10'	
P. I. (Overburden)				N.P.	
Estimated Quantity (cu. yds.)		worked out	150,000 plus	40,000	
Los Angeles Wear		23.2	27.2	24.0	
Soundness Loss			2.4	10.2	
Average Maximum Size				2"	
% Retained on 2" Sieve				0	
Pit Average % Passing	Crushed to:	as received	as received	as received	
	2"	92	100	100	
	1"	82	99	94	
	½"	72	89	75	
	No. 4	62	69	54	
	No. 10	52	51	42	
	No. 200	7	18	2	
Plasticity Index		N.P.	N.P.	N.P.	

Remarks:

CONSTRUCTION MATERIALS INVENTORY

MATERIAL PIT SUMMARY

Pit Number		6061	6062	6075	6148
Location	Section	4	Section 36	W½ line Sec. 9 & 16	SW¼ Sec. 30
	Township & Range	9N 2E	12N 3E	10N 3E	13N 4E
	County	Bernalillo	Sandoval	Bernalillo	Sandoval
Formation		Qg	Qt	Qt	Qt
Rock Type		sand & gravel	sand & gravel	sand & gravel	sand & gravel
Source Rock (Gravel)		various	various	various	various
Quality of Material		good	excellent	excellent	good to very good
Thickness of Material		10-15'	20'	20'	15' plus
Thickness of Cap (Caliche)					
Material Underlying Formation		sandy siltstone		sandy siltstone	gravel
Vegetation		grass	grass	grass	trees & grass
Local Terrain		hilly	terraces	terraces	gentle slopes
Thickness of Overburden			0-8'		0-7'
P. I. (Overburden)			N.P.		S.N.P.
Estimated Quantity (cu. yds)		100,000 plus	200,000 plus	50,000 plus	500,000 plus
Los Angeles Wear		26.0	25.2		26.4
Soundness Loss		2.7	3.2		1.6
Average Maximum Size		6"	6		6
% Retained on 2" Sieve		10	10		5
Pit Average % Passing	Crushed to:	as received	as received		as received
	2"	87	79		64
	1"	69	66		45
	½"	38	54		33
	No. 4	29	46		24
	No. 10	25	42		20
	No. 200	2	4		1
Plasticity Index		N.P.	N.P.		N.P.

Remarks:

Pit Number		6649	6716	696
Location	Section	Section 36	Not Sectionalized	Town of Alameda Grant
	Township & Range	13N 3E	Alameda Grant	12N 3E
	County	Sandoval	Sandoval	Sandoval
Formation		Qt	Qt	Qt?
Rock Type		sand & gravel	sand & gravel	sand & gravel
Source Rock (Gravel)				various
Quality of Material				good
Thickness of Material		15'	6-12'	10'
Thickness of Cap (Caliche)				
Material Underlying Formation				Siltstone & silt
Vegetation		cactus & pinon	grass	grass
Local Terrain		dissected terrace	dissected terrace	hilly
Thickness of Overburden		0-8'	0-8'	
P. I. (Overburden)				
Estimated Quantity (cu. yds.)		200,000 plus	200,000 plus	75,000 plus
Los Angeles Wear		24.8	24.8	22.5
Soundness Loss		2.6	3.9	2.9
Average Maximum Size				4"
% Retained on 2" Sieve		97		3
Pit Average % Passing	Crushed to:	as received	as received	as received
	2"	97	100	94
	1"	82	81	78
	½"	63	61	60
	No. 4	46	43	44
	No. 10	39	37	37
	No. 200	4	3	6
Plasticity Index		N.P.	N.P.	N.P.

Remarks:

EXPLANATION

QUAD No. 42

QUATERNARY

- Qal — Alluvium
- Qaa — Alluvial Aprons
- Qt_1 — Terrace deposits (Post glacial)
- Qt_4 — Terrace deposits (Early Bull Lake)
- Qab — Bolson deposits
- Ql — Landslide debris
- Qaf — Alluvial fan deposits
- Qp — Pediment deposits
- Qop — Older Pediment deposits
- Qpc — Pediment deposits
- Qb — Basalt

TERTIARY

- QTsf — Santa Fe Formation
- Tes — Espinaso Volcanics
- Tg — Galisteo Formation
- Ti — Intrusive rocks undivided
- Tn — Nacimiento Formation
- Tm — Monzonite
- Trh — Rhyolite

CRETACEOUS

- Kmv — Mesa Verde Group
- Km — Mancos Shale
- Kd — Dakota Sandstone

JURASSIC

- J — Jurassic rocks undivided

TRIASSIC

- TR — Triassic rocks undivided

PERMIAN

- Psa — San Andres Limestone
- P — Lower Permian undivided

PENNSYLVANIAN

- IPm — Madera Limestone
- IPs — Sandia Formation

MISS. & DEV.

- MD — Mississippian and Devonian rocks undivided

PRECAMBRIAN

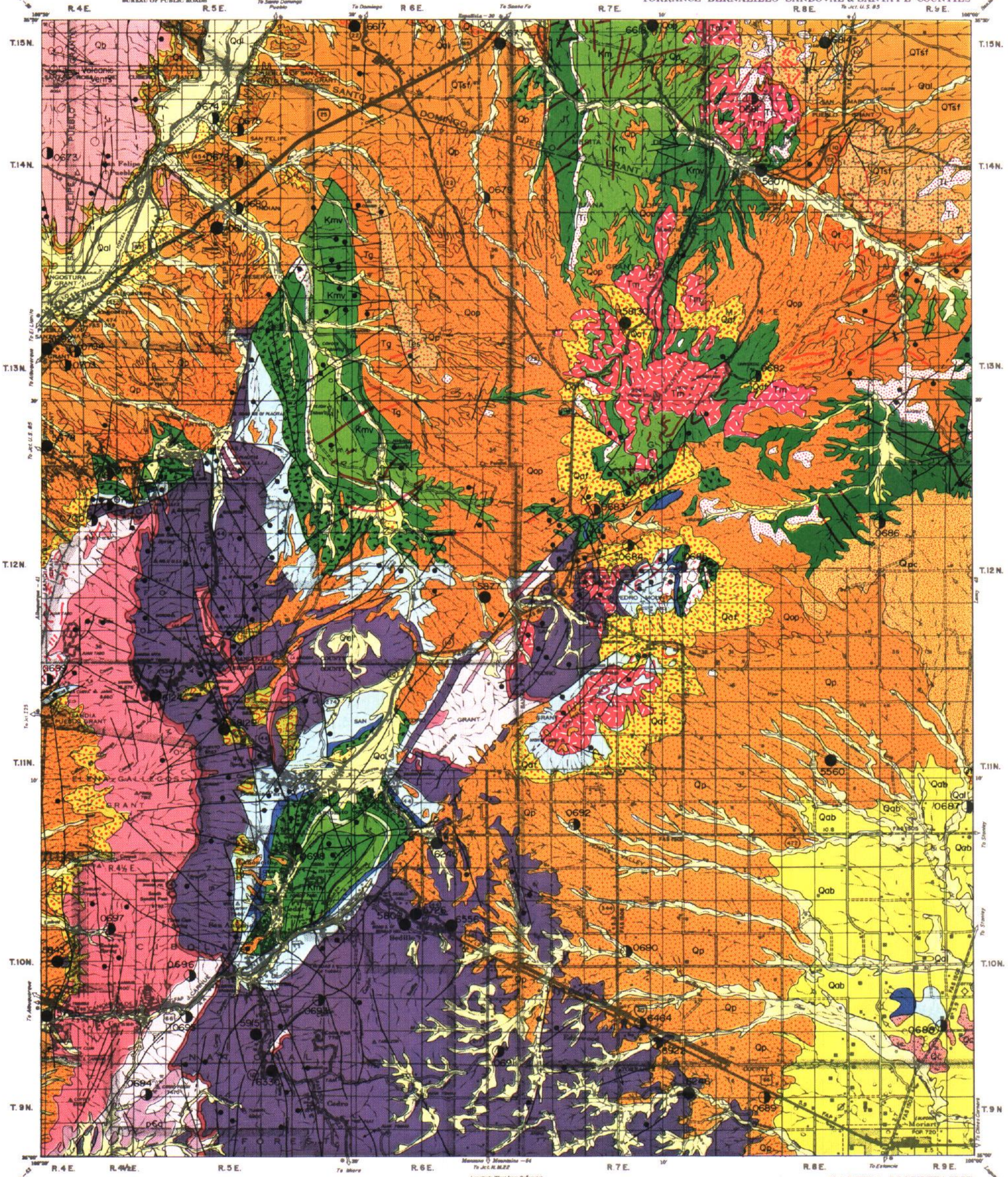
- p€q — Quartzite
- p€g — Granite
- p€m — Metamorphic rocks undivided

- Established pit or quarry
- Prospect pit or quarry
- Fault — downthrown side
- Anticline
- Syncline

NEW MEXICO STATE HIGHWAY DEPARTMENT
PLANNING AND PROGRAMMING DIVISION
BUREAU OF PUBLIC ROADS

GEOLOGY and AGGREGATE RESOURCES

SANDIA MOUNTAINS
QUADRANGLE - 42
TORRANCE BERNALILLO SANDOVAL & SANTA FE COUNTIES



Control by U.S. Coast and Geodetic Survey; U.S. Geological Survey; U.S. Forest Service; Bureau of Land Management and Planning Division—Modified Conic Projection Standard Parallel 36° North American Datum

DATE OF INVENTORY
GEOLOGY OCT. 1974
AGGREGATE RESOURCES OCT. 1974

Scale 1/190080 or 1 Inch = 3 Miles

DATE OF INVENTORY

BERNALILLO COUNTY	1964
SANTA FE COUNTY	1960
SANDOVAL COUNTY	1961
TORRANCE COUNTY	1961

SANDIA MOUNTAINS
QUADRANGLE
42

CONSTRUCTION MATERIALS INVENTORY

MATERIAL PIT SUMMARY

Pit Number		5560	5607	5678	5692
Location	Section	SE 1/4 15	NE 1/4 20	not sectionalized	S 1/2 15
	Township & Range	11N 8E	14N 8E	Bernalillo Grant	13N 4E
	County	Santa Fe	Santa Fe	Sandoval	Sandoval
Formation		Qal	Qt	QTsf	Qt
Rock Type		gravel	sand & gravel	sand & gravel	sand & gravel
Source Rock (Gravel)		various	various	limestone & various	various
Quality of Material		good	excellent	fair	good
Thickness of Material		12'	3' plus	20'	20'
Thickness of Cap (Caliche)		-	-	-	-
Material Underlying Formation		silt & clay	silt & sandstone	silt & clay	red sandstone & clay
Vegetation		grass	grass	juniper & grass	scattered juniper, grass
Local Terrain		rolling	hilly	hilly	hilly
Thickness of Overburden		0-2'	2'	1-6'	1-6'
P. I. (Overburden)		S.N.P.	S.N.P.	6-11	10
Estimated Quantity (cu. yds)		50,000 plus	50,000	unlimited	450,000
Los Angeles Wear		22.0	22.2	24.8	26.0
Soundness Loss		3.6	10.0	6.6	2.7
Average Maximum Size		5"	8"	12"	5"
% Retained on 2" Sieve		29	28	20	40
Pit Average % Passing	Crushed to:	as received	as received	as received	as received
	2"	66	71	80	73
	1"	52	61	72	50
	½"	43	53	62	35
	No. 4	37	43	47	22
	No. 10	35	34	33	18
	No. 200	22	2	8	1
Plasticity Index		N.P.	N.P.	N.P.	N.P.

Remarks:

Pit Number		5725	5726	5809	5843
Location	Section	SE 1/4 27	N 1/2 8	SE 1/4 9	14 & 23
	Township & Range	10N 4E	10N 6E	10N 6E	10N 4 E
	County	Bernalillo	Bernalillo	Bernalillo	Bernalillo
Formation		Qal	Pm	Pm	Pm
Rock Type		gravel	limestone	limestone	limestone
Source Rock (Gravel)		granite & limestone	-	-	-
Quality of Material		good	good	excellent	excellent
Thickness of Material		12'	30'	30' plus	50' plus
Thickness of Cap (Caliche)		-	-	-	-
Material Underlying Formation		silt & clay	shale	shale	-
Vegetation		grass	pinon & juniper	pinon & juniper	grass & juniper
Local Terrain		arroyo bank	mountainous	mountainous	hilly
Thickness of Overburden		0-3'	0-2'	1'	0-1'
P. I. (Overburden)		S.N.P.	11	8	N.P.
Estimated Quantity (cu. yds.)		200,000	200,000	180,000	750,000
Los Angeles Wear		32.0	26.8	21.6	30.0
Soundness Loss		3.2	2.5	0.7	6.2
Average Maximum Size		3"	-	-	-
% Retained on 2" Sieve		5	-	-	-
Pit Average % Passing	Crushed to:	as received	1"	1"	2"
	2"	74	-	-	100
	1"	68	100	100	54
	½"	61	42	73	25
	No. 4	50	16	28	11
	No. 10	36	8	15	6
	No. 200	6	1	2	1
Plasticity Index		N.P.	N.P.	N.P.	N.P.

Remarks:

CONSTRUCTION MATERIALS INVENTORY

MATERIAL PIT SUMMARY

Pit Number		5877	58129	58130	5915
Location	Section	not sectionalized	not sectionalized	not sectionalized	SE 1/4 34
	Township & Range	San Pedro Grant	Sandia Mountains	Ortiz Mine Grant	10N 5E
	County	Sandoval	Bernalillo	Santa Fe	Bernalillo
Formation		Qop	Ps	Qaf	Pm
Rock Type		gravel	limestone	sand & gravel	limestone
Source Rock (Gravel)		igneous & various	-	various	-
Quality of Material		excellent	good	good	good
Thickness of Material		10' plus	21' plus	9' plus	100'
Thickness of Cap (Caliche)		-	-	-	-
Material Underlying Formation		silt	granite	-	-
Vegetation		juniper	ponderosa pine	juniper	juniper
Local Terrain		hilly	mountainous	hilly	mountainous
Thickness of Overburden		3.5'	3-6'	1-4'	0-4'
P. I. (Overburden)		13	11	12	6
Estimated Quantity (cu. yds)		675,000 plus	unlimited	300,000	500,000 plus
Los Angeles Wear		26.8	23.6	25.6	23.6
Soundness Loss		2.9	1.0	3.7	2.1
Average Maximum Size		10"	-	15"	-
% Retained on 2" Sieve		27	-	31	-
Pit Average % Passing	Crushed to:	as received	1"	as received	1"
	2"	94	-	40	-
	1"	76	100	28	100
	½"	53	45	25	40
	No. 4	36	20	22	14
	No. 10	26	11	19	7
	No. 200	5	2	5	1
Plasticity Index		N.P.	N.P.	N.P.	N.P.
Remarks:					

Pit Number		6124	6245	6246	6330
Location	Section	not sectionalized	NE 1/4 34	SW 1/4 1	2
	Township & Range	Sandia Mountains	11N 6E	9N 7E	9N 5E
	County	Bernalillo	Bernalillo	Torrance	Bernalillo
Formation		Pm	Pm	Pm	Pm
Rock Type		limestone	limestone	limestone	limestone
Source Rock (Gravel)		-	-	-	-
Quality of Material		excellent	good	excellent	excellent
Thickness of Material		41' plus	12' plus	30'	43' plus
Thickness of Cap (Caliche)		-	-	-	-
Material Underlying Formation		granite	shale	clay & shale	shale & sandstone
Vegetation		pine	pinon & juniper	grass & juniper	juniper
Local Terrain		mountainous	mountainous	mountainous	mountainous
Thickness of Overburden		1-4'	3'	1'	-
P. I. (Overburden)		S.N.P.	14	11	-
Estimated Quantity (cu. yds.)		unlimited	600,000	660,000	unlimited
Los Angeles Wear		24.0	16.4	24.0	17.2
Soundness Loss		10.1	6.6	1.1	0.8
Average Maximum Size		-	-	-	-
% Retained on 2" Sieve		-	-	-	-
Pit Average % Passing	Crushed to:	1"	1"	1"	1"
	2"	-	-	-	-
	1"	100	100	100	100
	½"	65	38	48	56
	No. 4	25	28	23	20
	No. 10	13	16	14	9
	No. 200	3	5	5	1
Plasticity Index		N.P.	9	7	N.P.
Remarks:					

CONSTRUCTION MATERIALS INVENTORY

MATERIAL PIT SUMMARY

Pit Number		6464	6556	6615	6617
Location	Section	SE 1/4 27	SE 1/4 10	SW 1/4 27	W 1/2 29
	Township & Range	10N 7E	10N 6E	14N 5E	15N 6E
	County	Santa Fe	Bernalillo	Sandoval	Sandoval
Formation		Pm	Pm	QTsf	Qt
Rock Type		limestone	limestone	sand & gravel	sand & gravel
Source Rock (Gravel)		-	-	various	various
Quality of Material		good	good	excellent	excellent
Thickness of Material		8' plus	12' plus	10' plus	10' plus
Thickness of Cap (Caliche)		-	-	-	-
Material Underlying Formation		shale	shale	-	silt & sand
Vegetation		grass	pinon & juniper	grass, scattered juniper	grass
Local Terrain		rolling	mountainous	hilly	hilly
Thickness of Overburden		1'	1-2'	2'	2'
P. I. (Overburden)		6	8	11	5
Estimated Quantity (cu. yds)		425,000	380,000 plus	535,000	400,000
Los Angeles Wear		25.0	18.4	21.2	24.0
Soundness Loss		1.1	5.0	10.0	3.0
Average Maximum Size		-	-	6"	6"
% Retained on 2" Sieve		-	-	17	33
Pit Average % Passing	Crushed to:	1"	1"	as received	as received
	2"	-	-	90	72
	1"	100	100	63	54
	½"	74	48	44	37
	No. 4	26	17	31	25
	No. 10	13	9	25	21
	No. 200	3	1	3	5
Plasticity Index		N.P.	N.P.	N.P.	N.P.
Remarks:					

Pit Number		6618	6814	6922	0673
Location	Section	S 1/2 26	NW 1/4 34	NW 1/4 35	E 1/2 15
	Township & Range	15N 7E	15N 8E	10N 7E	14N 4E
	County	Santa Fe	Santa Fe	Santa Fe	Sandoval
Formation		QTsf	Tm	Pm	Qb
Rock Type		sand & gravel	monzonite	limestone	basalt
Source Rock (Gravel)		various	-	-	-
Quality of Material		excellent	good	excellent	good
Thickness of Material		18'	11' plus	50' plus	20' plus
Thickness of Cap (Caliche)		-	-	-	-
Material Underlying Formation		silt & shale	-	shale	sandstone
Vegetation		juniper & grass	juniper	grass & juniper	grass & juniper
Local Terrain		hilly	hilly	hilly	hilly
Thickness of Overburden		1-4'	1'	-	0-3'
P. I. (Overburden)		9	11	-	S.N.P.
Estimated Quantity (cu. yds.)		375,000	75,000 plus	unlimited	unlimited
Los Angeles Wear		24.0	25.6	25.6	18.4
Soundness Loss		11.9	12.6	1.7	4.7
Average Maximum Size		13"	-	-	-
% Retained on 2" Sieve		5	-	-	-
Pit Average % Passing	Crushed to:	as received	1"	1"	1"
	2"	100	-	-	-
	1"	90	100	100	100
	½"	69	79	97	63
	No. 4	44	33	56	27
	No. 10	30	21	34	17
	No. 200	7	5	5	5
Plasticity Index		N.P.	N.P.	N.P.	N.P.
Remarks:					

CONSTRUCTION MATERIALS INVENTORY

MATERIAL PIT SUMMARY

Pit Number		0674	0675	0676	0677
Location	Section	10 and 11	10 and 11	SE 1/4 15.	36
	Township & Range	14N 5E	14N 5E	14N 5E	15N 6E
	County	Sandoval	Sandoval	Sandoval	Sandoval
Formation		Qal	Qt	Qt	Qt
Rock Type		sand & gravel	sand & gravel	sand & gravel	sand & gravel
Source Rock (Gravel)		quartzite, basalt & igneous	quartzite & various	quartzite & various	various
Quality of Material		good	good	good	fair
Thickness of Material		8'	16'	15'	12'
Thickness of Cap (Caliche)		-	-	-	-
Material Underlying Formation		silt & sand	silt or clay	silt & clay	clay
Vegetation		grass	scattered cedar	scattered cedar, grass	grass
Local Terrain		flood plain	hilly	hilly	hilly
Thickness of Overburden		2'	2'	0-2'	2-6'
P. I. (Overburden)		S.N.P.	N.P.	N.P.	3-8
Estimated Quantity (cu. yds)		50,000	unlimited	unlimited	150,000 plus
Los Angeles Wear		24.0	24.0	24.0	26.8
Soundness Loss		5.4	5.2	4.9	8.4
Average Maximum Size		6"	6"	6"	2"
% Retained on 2" Sieve		8	5-10	5-10	5
Pit Average % Passing	Crushed to:	as received	as received	as received	3/4"
	2"	90	100	100	-
	1"	77	77	73	100
	½"	62	67	52	88
	No. 4	55	55	34	67
	No. 10	48	48	27	19
	No. 200	4	4	6	3
Plasticity Index		N.P.	N.P.	N.P.	N.P.
Remarks:					

Pit Number		0678	0679	0680	0681
Location	Section	SE 1/4 6	24	NW 1/4 26 & NE 1/4 27	SW 1/4 5
	Township & Range	14N 7E	14N 6E	14N 5E	14N 8E
	County	Santa Fe	Sandoval	Sandoval	Santa Fe
Formation		QTsf	QTsf	Qal	Ti
Rock Type		gravel	sand & gravel	sand & gravel	hornblende monzonite porphyry
Source Rock (Gravel)		various	monzonite & various	quartzite & igneous	-
Quality of Material		good	good	good	excellent
Thickness of Material		20'	15'	6' plus	20' plus
Thickness of Cap (Caliche)		-	-	-	-
Material Underlying Formation		siltstone	sand & clay	-	-
Vegetation		grass	scattered juniper	grass	juniper
Local Terrain		hilly	hilly	arroyo bottom	mountainous
Thickness of Overburden		0-2'	0-2'	0-3'	0-3'
P. I. (Overburden)		2	4	S.N.P.	S.N.P.
Estimated Quantity (cu. yds.)		unlimited	500,000	150,000	775,000 plus
Los Angeles Wear		24.1	18.4	26.4	20.4
Soundness Loss		3.8	3.0	7.1	4.0
Average Maximum Size		13"	6"	7"	-
% Retained on 2" Sieve		8	50	10	-
Pit Average % Passing	Crushed to:	as received	as received	as received	1"
	2"	92	50	78	
	1"	87	38	60	100
	½"	82	29	46	48
	No. 4	70	19	37	15
	No. 10	56	14	31	7
	No. 200	6	2	3	1
Plasticity Index		N.P.	7	N.P.	N.P.

Remarks: 0681: Sand in nearby arroyos available for filler material.

CONSTRUCTION MATERIALS INVENTORY

MATERIAL PIT SUMMARY

Pit Number		0682	0683	0684	0685
Location	Section	not sectionalized	not sectionalized	not sectionalized	not sectionalized
	Township & Range	Ortiz Mine Grant	Ortiz Mine Grant	Ortiz Mine Grant	Ortiz Mine Grant
	County	Santa Fe	Santa Fe	Santa Fe	Santa Fe
Formation		Qaf	Qop	Qaf	Psa
Rock Type		gravel	gravel	gravel	limestone
Source Rock (Gravel)		monzonite & various igneous	various	various	-
Quality of Material		good	good	good	excellent
Thickness of Material		20' plus	15' plus	10' plus	10' plus
Thickness of Cap (Caliche)		-	-	-	-
Material Underlying Formation		monzonite	sandstone	monzonite & sandstone	rhyolite & sandstone
Vegetation		juniper	juniper	juniper	juniper
Local Terrain		mountainous	hilly	mountainous	mountainous
Thickness of Overburden		0-1'	0-2'	0-2'	-
P. I. (Overburden)		S.N.P.	S.N.P.	S.N.P.	-
Estimated Quantity (cu. yds)		600,000 plus	380,000	235,000	20,000
Los Angeles Wear		25.6	20.7	26.0	20.0
Soundness Loss		8.1	9.5	5.4	3.7
Average Maximum Size		8"	6"	9"	-
% Retained on 2" Sieve		40	21	45	-
Pit Average % Passing	Crushed to:	as received	as received	as received	1"
	2"	64	73	36	100
	1"	54	59	20	76
	½"	47	45	18	27
	No. 4	39	33	15	10
	No. 10	34	28	13	4
	No. 200	12	9	7	1
Plasticity Index		N.P.	N.P.	N.P.	N.P.
Remarks:					

Pit Number		0686	0687	0688	0689
Location	Section	E 1/2 13	NE 1/4 29	SE 1/4 30	SW 1/4 5
	Township & Range	12N 8E	11N 9E	10N 9E	9N 8E
	County	Santa Fe	Santa Fe	Santa Fe	Torrance
Formation		Qpcg	Qt	Qpc	Qp
Rock Type		gravel	sand & gravel	caliche	gravel
Source Rock (Gravel)		igneous	various	-	limestone & various
Quality of Material		good	good	fair to good	good
Thickness of Material		8-14'	2-8'	2-4'	10' plus
Thickness of Cap (Caliche)		0-4'	-	2.5'	-
Material Underlying Formation		shale & sandstone	silt	sandstone	limestone
Vegetation		juniper	grass	grass	grass
Local Terrain		hilly	flat	rolling	rolling
Thickness of Overburden		0-2'	2'	0-2'	1'
P. I. (Overburden)		S.N.P.	S.N.P.	S.N.P.	S.N.P.
Estimated Quantity (cu. yds.)		775,000	30,000	15,000	450,000
Los Angeles Wear		25.2	28.0	24.8	18.1
Soundness Loss		12.5	7.2	9.7	6.2
Average Maximum Size		9"	3"	-	8"
% Retained on 2" Sieve		33	5	-	12
Pit Average % Passing	Crushed to:	as received	as received	1"	as received
	2"	82	100	-	82
	1"	48	93	100	65
	½"	34	83	67	56
	No. 4	24	69	23	44
	No. 10	19	57	11	35
	No. 200	9	20	2	17
Plasticity Index		N.P.	N.P.	N.P.	9
Remarks:					

CONSTRUCTION MATERIALS INVENTORY

MATERIAL PIT SUMMARY

Pit Number		0690	0691	0692	0693
Location	Section	NW 1/4 15	SW 1/4 36	SE 1/4 29	SE 1/4 24
	Township & Range	10N 7E	10N 6E	11N 7E	10N 5E
	County	Santa Fe	Bernalillo	Santa Fe	Bernalillo
Formation		Qal	Pm	Qp	Pm
Rock Type		gravel	limestone	sand & gravel	limestone
Source Rock (Gravel)		limestone	-	various	-
Quality of Material		fair	good	good	good
Thickness of Material		9' plus	50' plus	8' plus	25' plus
Thickness of Cap (Caliche)		-	-	0-2'	-
Material Underlying Formation		silt & clay	shale	sandstone	granite
Vegetation		grass	juniper	juniper & grass	juniper
Local Terrain		draw	mountainous	rolling	mountainous
Thickness of Overburden		1-4'	1'	0-4'	0-1'
P. I. (Overburden)		6	12	S.N.P.	14
Estimated Quantity (cu. yds)		100,000	250,000	585,000	unlimited
Los Angeles Wear		24.4	24.6	37.2	23.4
Soundness Loss		2.9	2.5	15.1	0.8
Average Maximum Size		8"	-	11"	-
% Retained on 2" Sieve		16	-	17	-
Pit Average % Passing	Crushed to:	as received	1"	as received	1"
	2"	80	-	87	-
	1"	65	100	78	100
	½"	48	44	59	45
	No. 4	30	14	44	16
	No. 10	19	7	35	8
	No. 200	8	1	11	2
Plasticity Index		7	N.P.	8	N.P.
Remarks:					

Pit Number		0694	0695	0696	0697
Location	Section	S 1/2 6 and N 1/2 7	NE 1/4 29	NE 1/4 21	SE 1/4 12
	Township & Range	9N 5E	10N 5E	10N 5E	10N 4E
	County	Bernalillo	Bernalillo	Bernalillo	Bernalillo
Formation		pCm	Qal	pCq	pCg
Rock Type		quartzite	gravel	quartzite	granite
Source Rock (Gravel)		-	limestone & igneous	-	-
Quality of Material		excellent	good	excellent	good
Thickness of Material		200'	3-15'	100'	1000' plus
Thickness of Cap (Caliche)		-	-	-	-
Material Underlying Formation		schist	granite	gneiss	-
Vegetation		scrub oak & juniper	juniper & grass	juniper	grass to none
Local Terrain		mountainous	canyon	mountainous	mountainous
Thickness of Overburden		-	0-4'	-	0-1'
P. I. (Overburden)		-	S.N.P.	-	S.N.P.
Estimated Quantity (cu. yds.)		unlimited	100,000	500,000 plus	unlimited
Los Angeles Wear		22.0	27.9	25.2	42.0
Soundness Loss		0.6	4.1	1.2	3.0
Average Maximum Size		-	28"	-	-
% Retained on 2" Sieve		-	28	-	-
Pit Average % Passing	Crushed to:	1"	as received	1"	1"
	2"	-	66	-	-
	1"	100	51	100	100
	½"	40	31	34	69
	No. 4	13	15	11	28
	No. 10	6	9	6	15
	No. 200	1	3	1	2
Plasticity Index		N.P.	N.P.	N.P.	N.P.
Remarks:					

CONSTRUCTION MATERIALS INVENTORY

MATERIAL PIT SUMMARY

Pit Number		0698	0699	0700	0701
Location	Section	SW 1/4 36	W 1/2 2	S 1/2 12	12
	Township & Range	11N 5E	11N 4E	12N 4E	12N 4E
	County	Bernalillo	Bernalillo	Sandoval	Sandoval
Formation		J	pEu	Pm	Pm
Rock Type		gypsiferous limestone	mica schist	limestone	limestone
Source Rock (Gravel)		-	-	-	-
Quality of Material		poor	poor	good	good
Thickness of Material		8'	200' plus	50' plus	50'
Thickness of Cap (Caliche)		-	-	-	-
Material Underlying Formation		gypsum	-	shale	shale
Vegetation		pinon & juniper	grass	grass & juniper	pinon, juniper & cedar
Local Terrain		mountainous	mountainous	hilly	mountainous
Thickness of Overburden		0-3'	0-1'	0-4'	0-2'
P. I. (Overburden)		S.N.P.	S.N.P.	8	8
Estimated Quantity (cu. yds)		10,000	1,000,000 plus	200,000	unlimited
Los Angeles Wear		31.3	34.9	19.2	19.2
Soundness Loss		6.3	20.3	5.6	2.5
Average Maximum Size		-	-	-	-
% Retained on 2" Sieve		-	-	-	-
Pit Average % Passing	Crushed to:	1"	1"	1"	1"
	2"	-	-	-	-
	1"	100	100	100	100
	½"	68	61	59	47
	No. 4	26	26	17	17
	No. 10	12	16	9	9
	No. 200	2	3	2	2
Plasticity Index		N.P.	N.P.	N.P.	N.P.
Remarks:					

Pit Number		0702	0703	0704
Location	Section	NE 1/4 1	14	E 1/2 14
	Township & Range	12N 4E	13N 4E	13N 4E
	County	Sandoval	Sandoval	Sandoval
Formation		Qt	Qal	Qt
Rock Type		sand & gravel	sand & gravel	sand & gravel
Source Rock (Gravel)		limestone & igneous	limestone & various	limestone & various
Quality of Material		good	good	good
Thickness of Material		25'	10' plus	15'
Thickness of Cap (Caliche)		-	-	-
Material Underlying Formation		sandstone	silt & clay	clean sand
Vegetation		grass	grass & juniper	pinon, cedar & juniper
Local Terrain		mountainous	stream valley	hilly
Thickness of Overburden		0-4'	0-4'	2-4'
P. I. (Overburden)		S.N.P.	S.N.P.	N.P.
Estimated Quantity (cu. yds.)		100,000	325,000	unlimited
Los Angeles Wear		25.6	25.0	22.0
Soundness Loss		4.5	0.9	8.2
Average Maximum Size		4"	12"	12"
% Retained on 2" Sieve		11	10-20	15-25
Pit Average % Passing	Crushed to:	as received	as received	as received
	2"	57	77	72
	1"	47	57	56
	½"	42	43	44
	No. 4	35	28	32
	No. 10	24	20	23
	No. 200	5	3	4
Plasticity Index		N.P.	N.P.	N.P.
Remarks:				

EXPLANATION

QUAD No. 49

QUATERNARY

- Qal — Alluvium
- Qe — Eolian deposits
- Ql — Landslide Debris
- Qt — Terrace deposits (Post Glacial)
- Qp — Pediment deposits
- Qb_3 — Basalt (Oldest)
- QTg — Older gravel deposits

TERTIARY

- Ti — Intrusive rocks undivided
- Tb — Basalt
- Tdvs — Datil Sedimentary series

CRETACEOUS

- Kcc — Crevasse Canyon Formation
- Kg — Gallup Sandstone
- Kmv — Mesa Verde Group
- Km — Mancos Shale
- Kd — Dakota Sandstone

JURASSIC

- J — Jurassic rocks undivided

TRIASSIC

- R — Triassic rocks undivided

- Established pit or quarry
- Prospect pit or quarry
- Fault — downthrown side
- Anticline
- Syncline

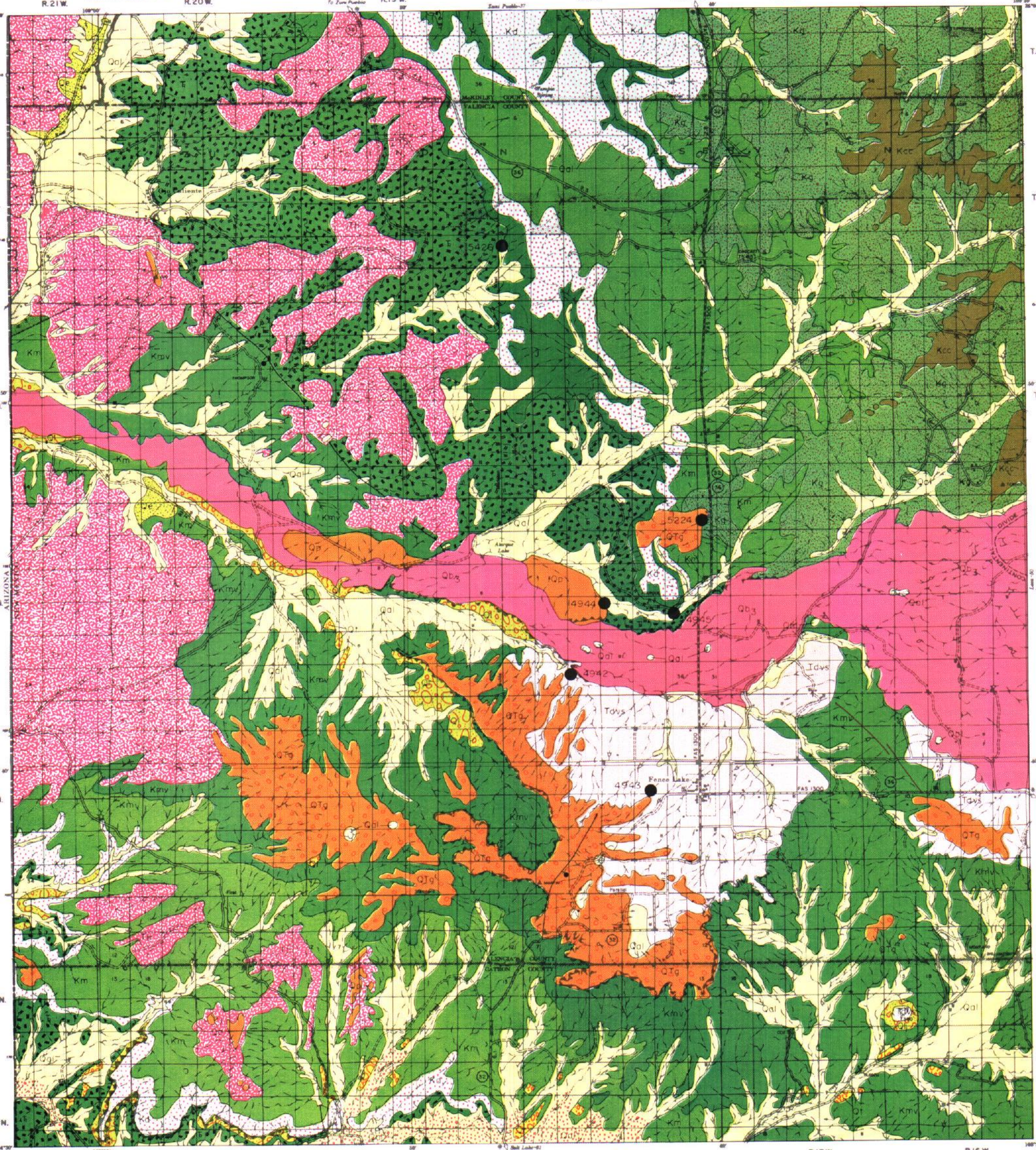
NEW MEXICO STATE HIGHWAY DEPARTMENT
PLANNING AND PROGRAMMING DIVISION
BUREAU OF PUBLIC ROADS

GEOLOGY and AGGREGATE RESOURCES

ATARQUE QUADRANGLE-49
McKINLEY VALENCIA & CATRON COUNTIES

R.21W. R.20W. R.19W. R.18W. R.17W. R.16W.

T.9N. T.8N. T.7N. T.6N. T.5N. T.4N. T.3N.



Control by U.S. Coast and Geodetic Survey, U.S. Geological Survey, U.S. Forest Service, Bureau of Land Management and Planning Division—Modified Conic Projection Standard Parallel 34½° North American Datum

DATE OF INVENTORY
GEOLOGY SEPT 1977
AGGREGATE RESOURCES SEPT 1977

Scale 1/126720 or 1 Inch = 3 Miles

DATE OF INVENTORY
CATRON COUNTY 1963
McKINLEY COUNTY 1964
VALENCIA COUNTY 1962

ATARQUE QUADRANGLE 49

CONSTRUCTION MATERIALS INVENTORY

MATERIAL PIT SUMMARY

Pit Number		4942	4943	4944	4945
Location	Section	W½ Sec. 33	South Center Sec. 14	NW¼ Sec. 22	Section 24
	Township & Range	6N 18W	5N 18W	6N 18W	6N 18W
	County	Valencia	Valencia	Valencia	Valencia
Formation		Tdvs	Tdvs	Qp	Qal
Rock Type		sand & gravel	sand & gravel	sand & gravel	sand
Source Rock (Gravel)					
Quality of Material					
Thickness of Material					
Thickness of Cap (Caliche)					
Material Underlying Formation					
Vegetation					
Local Terrain					
Thickness of Overburden					
P. I. (Overburden)					
Estimated Quantity (cu. yds)					
Los Angeles Wear					
Soundness Loss					
Average Maximum Size					
% Retained on 2" Sieve					
Pit Average % Passing	Crushed to:				
	2"				
	1"				
	½"				
	No. 4				
	No. 10				
	No. 200				
Plasticity Index					
Remarks:					

Pit Number		5224	5426
Location	Section	NW¼ Sec. 6	NE¼ NW¼ Sec. 30
	Township & Range	6N 17W	8N 18W
	County	Valencia	Valencia
Formation		Qtg	Qal
Rock Type		sand & gravel	conglomerate, sand & gravel
Source Rock (Gravel)			
Quality of Material			
Thickness of Material			
Thickness of Cap (Caliche)			
Material Underlying Formation			
Vegetation			
Local Terrain			
Thickness of Overburden			
P. I. (Overburden)			
Estimated Quantity (cu. yds.)			
Los Angeles Wear			
Soundness Loss			
Average Maximum Size			
% Retained on 2" Sieve			
Pit Average % Passing	Crushed to:		
	2"		
	1"		
	½"		
	No. 4		
	No. 10		
	No. 200		
Plasticity Index			
Remarks:			

EXPLANATION

QUAD No. 50

QUATERNARY

- Qal — Alluvium
- Qp — Pediment deposits
- Ql — Landslide Debris
- Qe — Eolian deposits
- Qb — Basalt (Youngest or undiff.)
- Qb_2 — Basalt (Intermediate)
- Qb_3 — Basalt (Oldest)
- Qc — Cinders and Scoria
- QTb — Basalt
- QTg — Older gravel deposits

TERTIARY

- Tdvs — Datil Sedimentary series
- Ti — Intrusive rocks undivided
- Tbc — Baca Formation

CRETACEOUS

- Kcc — Crevasse Canyon Formation
- Kg — Gallup Sandstone
- Kmv — Mesa Verde Group
- Km — Mancos Shale

JURASSIC

- Kd — Dakota Sandstone
- J — Jurassic rocks undivided

PERMIAN

- Pg — Glorieta Sandstone
- Py — Yeso Formation
- Pa — Abo Formation

PRECAMBRIAN

- p€ — Precambrian undivided

- Established pit or quarry
- Prospect pit or quarry
- Fault — downthrown side
- Anticline
- Syncline

NEW MEXICO STATE HIGHWAY DEPARTMENT

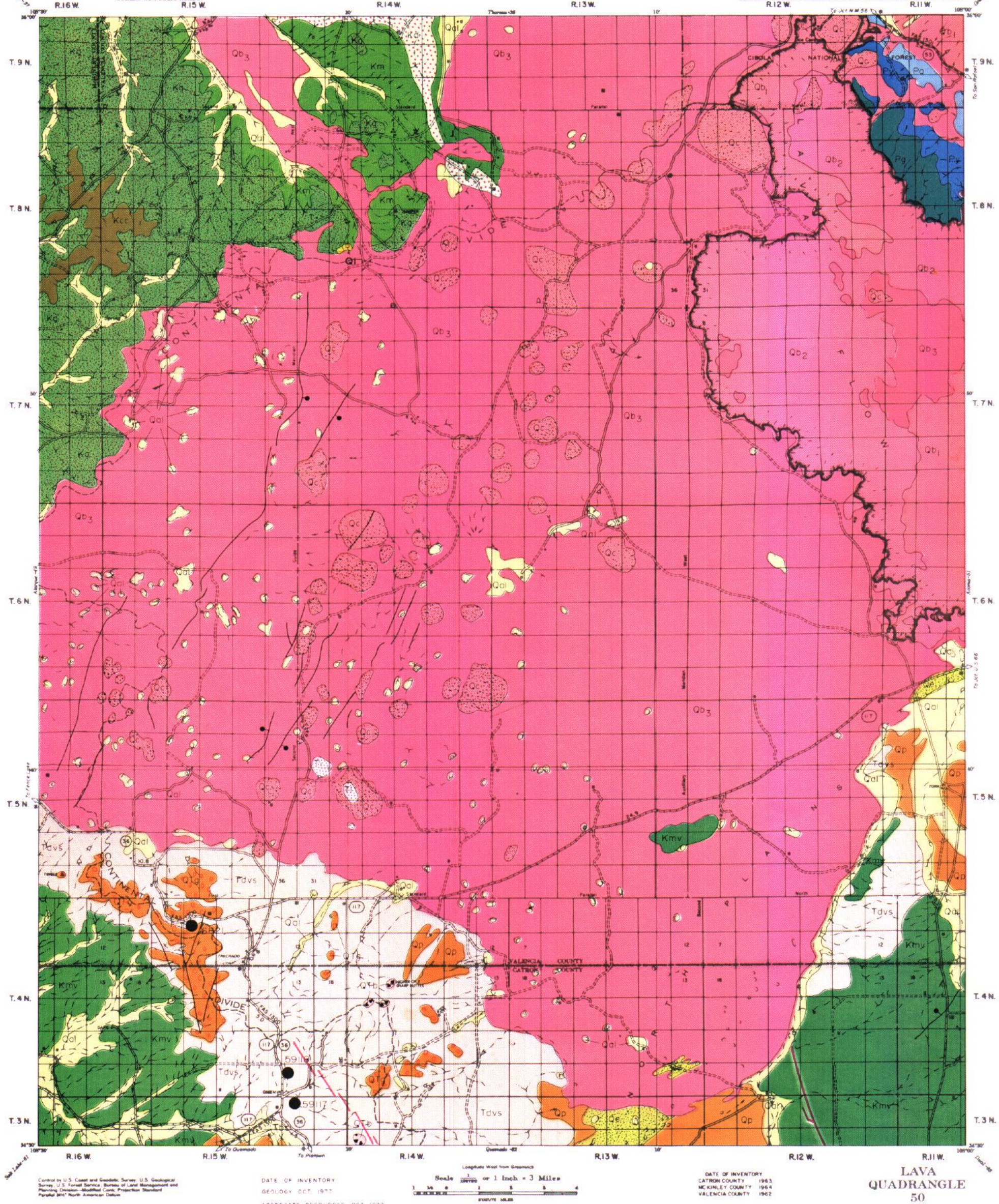
PLANNING AND PROGRAMMING DIVISION

BUREAU OF PUBLIC ROADS

GEOLOGY and AGGREGATE RESOURCES

LAVA QUADRANGLE - 50

McKINLEY VALENCIA & CATRON COUNTIES



Control by U.S. Coast and Geodetic Survey, U.S. Geological Survey, U.S. Forest Service, Bureau of Land Management and Planning Division—Modified Conic Projection Standard Parallel 34½° North American Datum

DATE OF INVENTORY
GEOLOGY OCT. 1977
AGGREGATE RESOURCES OCT. 1977

Longitude West from Greenwich

Scale $\frac{1}{190080}$ or 1 Inch = 3 Miles

1 3/4 0 1 2 3 4

STATUTE MILES

DATE OF INVENTORY
CATRON COUNTY 1963
MCKINLEY COUNTY 1964
VALENCIA COUNTY 1962

LAVA QUADRANGLE 50

CONSTRUCTION MATERIALS INVENTORY

MATERIAL PIT SUMMARY

Pit Number		59117	59118	6821
Location	Section	N½ 1	NW¼ Sec. 36	SW¼ Sec. 4
	Township & Range	3N 15W	4N 15W	Valencia
	County	Catron	Catron	
Formation		Tdvs	Tdvs	Qtg
Rock Type		sand & gravel	sand & gravel	
Source Rock (Gravel)				
Quality of Material				
Thickness of Material				6-12' plus
Thickness of Cap (Caliche)				
Material Underlying Formation				
Vegetation		pinon & trees		grass, cedar & pinon
Local Terrain		hill		small ridge
Thickness of Overburden				2-3'
P. I. (Overburden)				
Estimated Quantity (cu. yds)				
Los Angeles Wear				24.0
Soundness Loss				17.7
Average Maximum Size				
% Retained on 2" Sieve				
Pit Average % Passing	Crushed to:			as received
	2"			43
	1"			30
	½"			26
	No. 4			19
	No. 10			14
	No. 200			2
Plasticity Index				N.P.
Remarks:				

Pit Number	
Location: Section	
Township & Range	
County	
Formation	
Rock Type	
Source Rock (Gravel)	
Quality of Material	
Thickness of Material	
Thickness of Cap (Caliche)	
Material Underlying Formation	
Vegetation	
Local Terrain	
Thickness of Overburden	
P. I. (Overburden)	
Estimated Quantity (cu. yds.)	
Los Angeles Wear	
Soundness Loss	
Average Maximum Size	
% Retained on 2" Sieve	
Pit Average % Passing: Crushed to:	
2"	
1"	
½"	
No. 4	
No. 10	
No. 200	
Plasticity Index	
Remarks:	

EXPLANATION

QUAD No. 51

QUATERNARY

- Qal — Alluvium
- Qe — Eolian deposits
- Ql — Landslide Debris
- Qt — Terrace deposits (Post Glacial)
- Qp — Pediment deposits
- Qb — Basalt (Youngest or undiff.)
- Qb_2 — Basalt (Intermediate)
- Qb_3 — Basalt (Oldest)
- QTb — Basalt
- QTb_2 — Older Basalt

TERTIARY

- Tc — Older Cinders
- Tb — Basalt
- Td — Datil Volcanics undifferentiated

CRETACEOUS

- Kmv — Mesa Verde Group
- Km — Mancos Shale
- Kmth — Tres Hermanos S.S. Mbr. & Mancos Shale
- Kd — Dakota Sandstone

JURASSIC

- J — Jurassic rocks undivided
- Jm — Morrisone Formation
- Jbs — Bluff and Summerville Fm.
- Jet — Entrada and Todilto undivided

TRIASSIC

- TR — Triassic rocks undivided

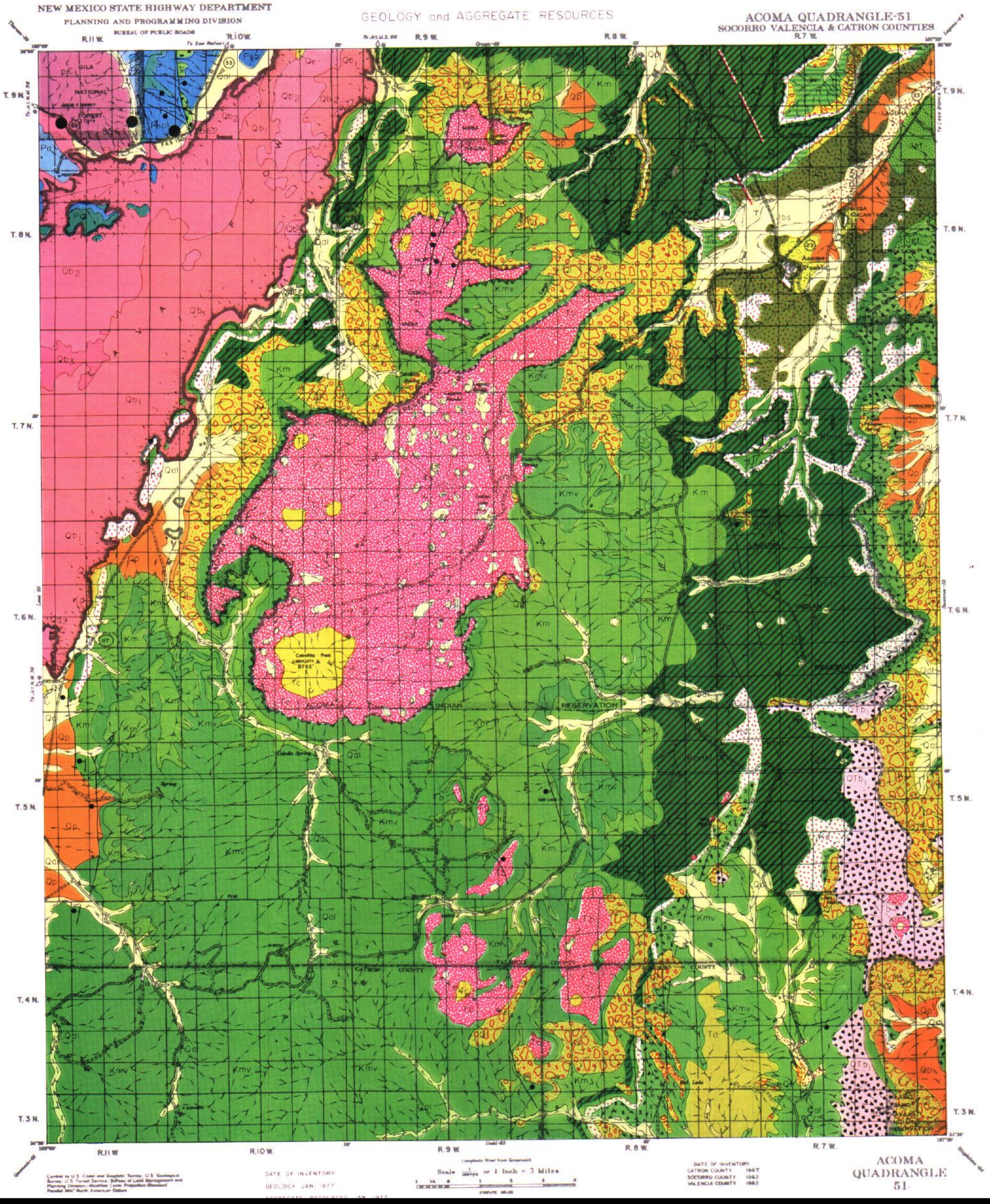
PERMIAN

- Psa — San Andres Limestone
- Pg — Glorieta Sandstone
- Py — Yeso Formation
- Pa — Abo Formation

PRECAMBRIAN

- p€ — Precambrian undivided

- Established pit or quarry
- Prospect pit or quarry
- Fault — downthrown side
- Anticline
- Syncline


NEW MEXICO STATE HIGHWAY DEPARTMENT
PLANNING AND PROGRAMMING DIVISION
BUREAU OF PUBLIC ROADS
GEOLOGY and AGGREGATE RESOURCES
ACOMA QUADRANGLE-51
SOCORRO VALENCIA & CATRON COUNTIES
R.11 W.
R.10 W.
R.9 W.
R.8 W.
R.7 W.
T.9 N.
T.8 N.
T.7 N.
T.6 N.
T.5 N.
T.4 N.
T.3 N.
Kmv
Km
Qal
Qb1
Qb2
Qp
QTb
Cebolleta Peak
INDIAN
RESERVATION
CATRON COUNTY
Longitude West from Greenwich
Scale 1/190,080 or 1 Inch = 3 Miles
Control by U.S. Coast and Geodetic Survey; U.S. Geological Survey; U.S. Forest Service; Bureau of Land Management and Planning Division—Modified Conic Projection Standard Parallel 36½° North American Datum
DATE OF INVENTORY
GEOLOGY JAN. 1977
AGGREGATE RESOURCES JAN. 1977
DATE OF INVENTORY
CATRON COUNTY 1963
SOCORRO COUNTY 1962
VALENCIA COUNTY 1962
ACOMA
QUADRANGLE
51

MATERIAL PIT SUMMARY

Pit Number		5562	5563	5564
Location	Section	S½ Sec. 37	Section 36	SW¼ Sec. 34
	Township & Range	9N 10W	9N 11W	9N 10W
	County	Valencia	Valencia	Valencia
Formation		Psa	Pe	Pe
Rock Type		limestone	granite	weathered granite
Source Rock (Gravel)				
Quality of Material				
Thickness of Material				7-10'
Thickness of Cap (Caliche)				
Material Underlying Formation				
Vegetation			cedar & pine	
Local Terrain			hill	
Thickness of Overburden				0-5'
P. I. (Overburden)				8
Estimated Quantity (cu. yds)		unlimited	unlimited	unlimited
Los Angeles Wear		31.2		61.6
Soundness Loss				
Average Maximum Size				
% Retained on 2" Sieve				
Pit Average % Passing	Crushed to:	3/4"		3/4"
	2"			
	1"	(3/4") 100	(3/4")	100
	½"	67		93
	No. 4	27		68
	No. 10	16		47
	No. 200	2		18
Plasticity Index		N.P.		N.P.
Remarks:				

Pit Number	
Location	Section
	Township & Range
	County
Formation	
Rock Type	
Source Rock (Gravel)	
Quality of Material	
Thickness of Material	
Thickness of Cap (Caliche)	
Material Underlying Formation	
Vegetation	
Local Terrain	
Thickness of Overburden	
P. I. (Overburden)	
Estimated Quantity (cu. yds.)	
Los Angeles Wear	
Soundness Loss	
Average Maximum Size	
% Retained on 2" Sieve	
Pit Average % Passing — Crushed to:	
2"	
1"	
½"	
No. 4	
No. 10	
No. 200	
Plasticity Index	
Remarks:	

EXPLANATION

QUAD No. 52

QUATERNARY

- Qal — Alluvium
- Qaa — Alluvial Aprons
- Qab — Bolson deposits
- Qe — Eolian deposits
- Qt — Terrace deposits (Post Glacial)
- Qp — Pediment deposits
- Ql — Landslide Debris
- Qt_2 — Terrace deposits (Pinedale)
- Qt_3 — Terrace deposits (Late Bull Lake)
- Qip — Intermediate Pediment deposits
- Qb — Basalt (Youngest or undiff.)
- Qv — Volcanics undivided
- Qc — Cinders and Scoria
- Qs — Spring deposits
- Qb_2 — Basalt (Intermediate)
- Qb_3 — Basalt (Oldest)
- Qop — Older Pediment deposits
- QTsf — Santa Fe Formation

QUATERNARY-TERTIARY

- QTb — Basalt

TERTIARY

- Ti — Intrusive rocks undivided
- Tb — Basalt

CRETACEOUS

- Kmv — Mesa Verde Group
- Kg — Gallup Sandstone
- Km — Mancos Shale
- Kd — Dakota Sandstone

JURASSIC

- Jm — Morrison Formation
- Jbs — Bluff and Summerville Formation
- Jt — Todilto Formation
- Je — Entrada Formation

TRIASSIC

- TR — Triassic rocks undivided

PERMIAN

- Psa — San Andres Limestone
- Pg — Glorieta Sandstone
- Py — Yeso Formation
- Pa — Abo Formation

PENNSYLVANIAN

- Pm — Madera Limestone

PRECAMBRIAN

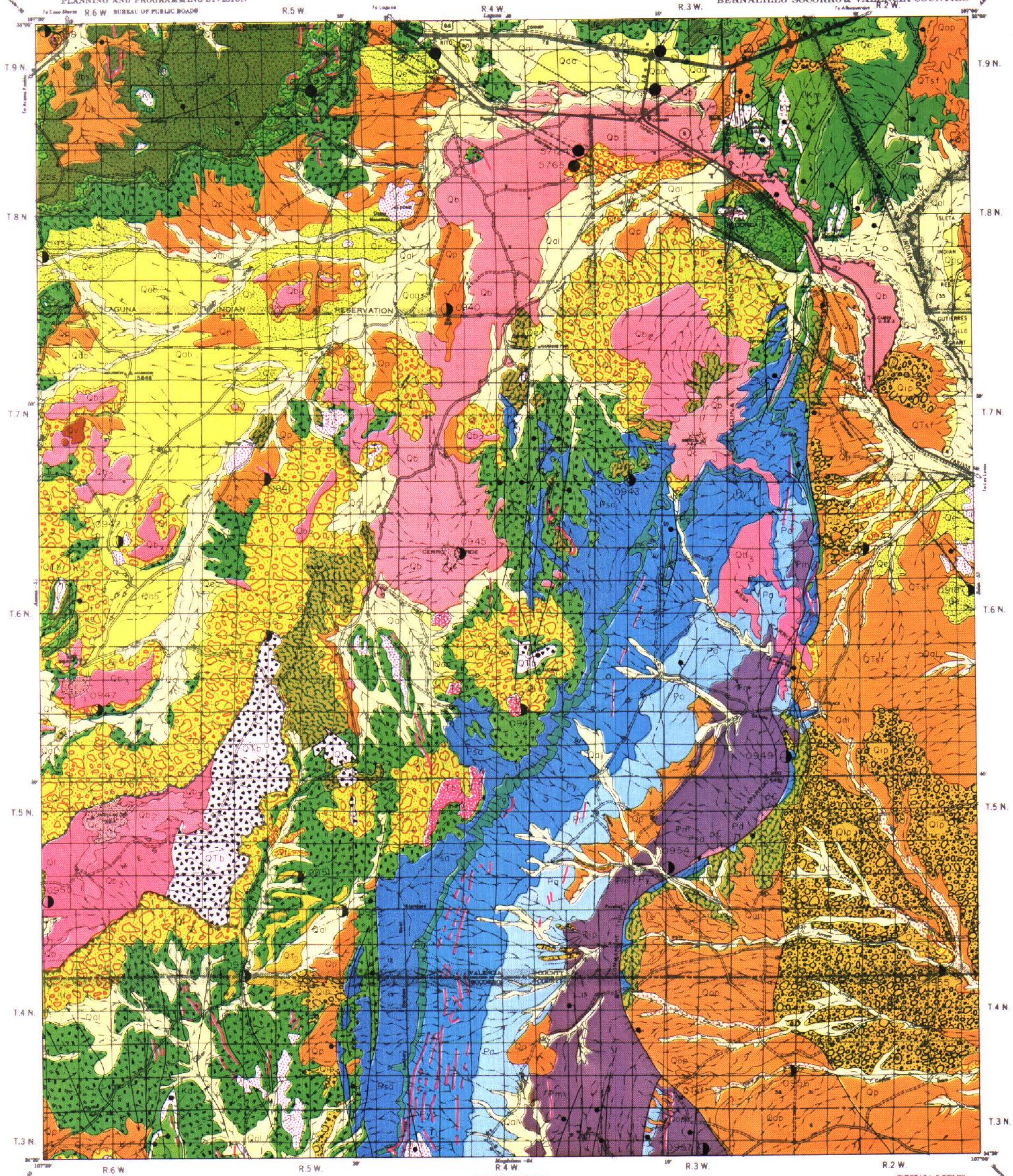
- p€ — Precambrian undivided

- Established pit or quarry
- Prospect pit or quarry
- Fault — downthrown side
- Anticline
- Syncline

NEW MEXICO STATE HIGHWAY DEPARTMENT
PLANNING AND PROGRAMMING DIVISION
BUREAU OF PUBLIC ROADS

GEOLOGY and AGGREGATE RESOURCES

SUWANEE QUADRANGLE-52
BERNALILLO SOCORRO & VALENCIA COUNTIES



Control by U.S. Coast and Geodetic Survey, U.S. Geological Survey, U.S. Forest Service, Bureau of Land Management and Planning Division—Modified Conic Projection Standard Parallel 34½° North American Datum

DATE OF INVENTORY
GEOLOGY DEC. 1977
AGGREGATE RESOURCES DEC. 1977

Longitude West from Greenwich

Scale 1/190080 or 1 Inch = 3 Miles

STATUTE MILES

DATE OF INVENTORY
BERNALILLO COUNTY 1964
SOCORRO COUNTY 1962
VALENCIA COUNTY 1962

SUWANEE
QUADRANGLE
52

CONSTRUCTION MATERIALS INVENTORY

QUADRANGLE PAGE 52

MATERIAL PIT SUMMARY

Pit Number		5765		5776	5779		5780
Location	Section	E½ 12		NW¼ 29	NE¼ 33		NW¼ 28
	Township & Range	8N 4W		9N 4W	9N 3W		9N 3W
	County	Valencia		Valencia	Valencia		Valencia
Formation		Qt		Qe	Qb		Qaa
Rock Type		sand & gravel		dune sand	basalt		silty sand
Source Rock (Gravel)		basalt & various					
Quality of Material		good		good	poor		poor
Thickness of Material		16' plus		10-15'	20'		5' plus
Thickness of Cap (Caliche)							
Material Underlying Formation		silt		shale	clay		sandstone
Vegetation		grass		grass	grass		grass
Local Terrain		rolling		rolling	rolling		sloping plain
Thickness of Overburden		1-6'		0-2'	0-3'		0-2'
P. I. (Overburden)		7		S.N.P.	6		S.N.P.
Estimated Quantity (cu. yds)		150,000 plus		50,000 plus	150,000 plus		250,000 plus
Los Angeles Wear		29.2			40.8		
Soundness Loss		20.4		S.E.: 42	9.9		S.E.: 36
Average Maximum Size		4"					
% Retained on 2" Sieve		10					
Pit Average % Passing	Crushed to:	as received		as received	2"		as received
	2"	94			100		
	1"	91			40		
	½"	83	No. 10:	100	22	No. 10:	100
	No. 4	59	No. 40:	99	12	No. 40:	93
	No. 10	42	No. 80;	89	8	No. 80:	83
	No. 200	7	No. 200:	13	2	No. 200;	31
Plasticity Index		N.P.		N.P.	N.P.		N.P.

Remarks:

Pit Number		57124
Location	Section	E½ 12
	Township & Range	8N 4W
	County	Valencia
Formation		Qt
Rock Type		sand & gravel
Source Rock (Gravel)		basalt & various
Quality of Material		good
Thickness of Material		15' plus
Thickness of Cap (Caliche)		
Material Underlying Formation		silt
Vegetation		grass
Local Terrain		rolling
Thickness of Overburden		2-4'
P. I. (Overburden)		N.P.
Estimated Quantity (cu. yds.)		300,000 plus
Los Angeles Wear		22.8
Soundness Loss		20.4
Average Maximum Size		4"
% Retained on 2" Sieve		8
Pit Average % Passing	Crushed to:	as received
	2"	90
	1"	81
	½"	72
	No. 4	53
	No. 10	35
	No. 200	2
Plasticity Index		N.P.

Remarks:

EXPLANATION

QUAD No. 53

QUATERNARY

- Qal — Alluvium
- Qfp — Floodplain deposits
- Qaa — Alluvial Aprons
- Qe — Eolian deposits
- Qp — Pediment deposits
- Qt — Terrace deposits (Post Glacial)
- Qaf — Alluvial fan deposits
- Qc — Cinders and Scoria
- Qb — Basalt (Youngest or undiff.)
- Qip — Intermediate Pediment deposits
- Qop — Older Pediment deposits
- QTsf — Santa Fe Formation

TER-TIARY

- Ti — Intrusive rocks undivided

CRETA-CEOUS

- Kmv — Mesa Verde Group

JUR-ASSIC

- Je — Entrada Formation

TRI-ASSIC

- TR — Triassic rocks undivided

- Psa — San Andres Limestone

PERMIAN

- Pg — Glorieta Sandstone
- Py — Yeso Formation
- Pa — Abo Formation

PENNSYLVANIAN

- IPm — Madera Limestone

PRECAMBRIAN

- p€g — Granite
- p€q — Quartzite
- p€m — Metamorphic rocks undivided

- Established pit or quarry
- Prospect pit or quarry
- Fault — downthrown side
- Anticline
- Syncline

NEW MEXICO STATE HIGHWAY DEPARTMENT

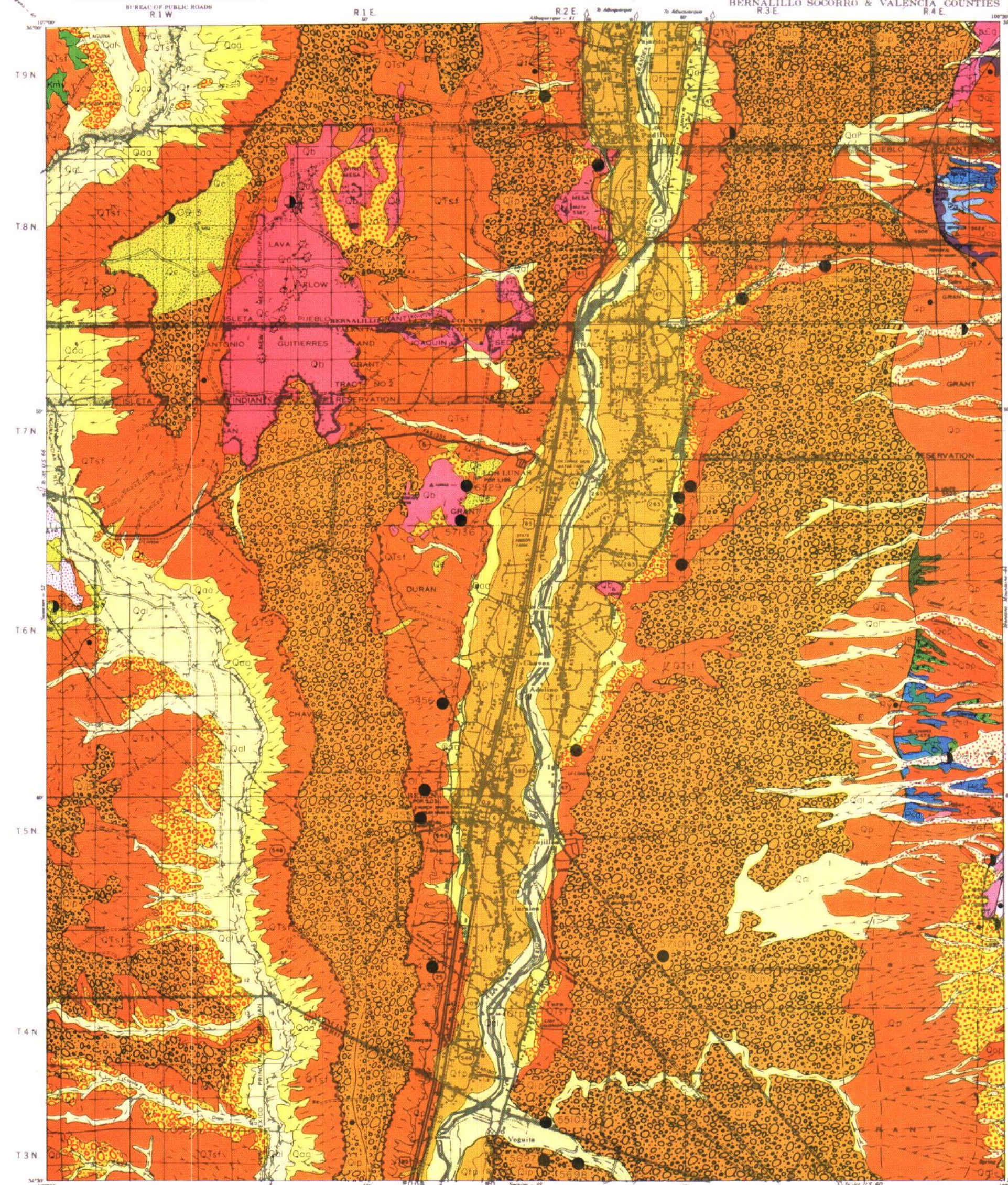
PLANNING AND PROGRAMMING DIVISION

BUREAU OF PUBLIC ROADS

GEOLOGY and AGGREGATE RESOURCES

BELEN QUADRANGLE 53

BERNALILLO SOCORRO & VALENCIA COUNTIES



Control by U.S. Coast and Geodetic Survey, U.S. Geological Survey, U.S. Forest Service, Bureau of Land Management and Planning Division—Modified Lyric Projection Standard Parallel 34°, North American Datum

DATE OF INVENTORY

GEOLOGY JAN. 1978

AGGREGATE RESOURCES JAN. 1978

Scale 1/126720 or 1 Inch = 3 Miles

STATUTE MILES

BELEN QUADRANGLE 53

CONSTRUCTION MATERIALS INVENTORY

QUADRANGLE PAGE 53 (1)

MATERIAL PIT SUMMARY

Pit Number		5455	5456	55103	55104
Location	Section	not sectionalized	not sectionalized	not sectionalized	not sectionalized
	Township & Range	Belen Grant	Nicolas Duran de Chavez Grant	Casa Colorado Grant	Belen Grant
	County	Valencia	Valencia	Valencia	Valencia
Formation		QTsf	Qt	Qt	QTsf
Rock Type		sand and gravel	sand and gravel	sand and gravel	sand and gravel
Source Rock (Gravel)		various	limestone and various	various	various
Quality of Material		fair	good	good	fair
Thickness of Material		76' plus	10' plus	8'	12'
Thickness of Cap (Caliche)			-	-	-
Material Underlying Formation		silt and clay	sandstone	gravel and sand	clay
Vegetation		cacti and grass	grass and greasewood	grass	greasewood and grass
Local Terrain		dissected slope	mesa slope	hilly	slope
Thickness of Overburden		3'	0-2'	0-3'	0-6'
P. I. (Overburden)		N.P.	N.P.	N.P.	N.P.
Estimated Quantity (cu. yds)		500,000	150,000 plus	200,000	200,000
Los Angeles Wear		29.4	28.0	26.2	26.0
Soundness Loss		6.1	8.6	3.5	15.0
Average Maximum Size		2"	2"	4"	2"
% Retained on 2" Sieve		1	6	11	3
Pit Average % Passing	Crushed to:	1"	as received	as received	as received
	2"	-	97	100	100
	1"	100	90	84	98
	½"	98	79	62	92
	No. 4	68	59	45	74
	No. 10	45	42	38	57
	No. 200	5	5	10	3
Plasticity Index		N.P.	N.P.	N.P.	N.P.

Remarks:

Pit Number		5697	5698	5704	57104
Location	Section	not sectionalized	not sectionalized	NE 26	not sectionalized
	Township & Range	Casa Colorado Grant	Casa Colorado Grant	8N 3E	Tome claim
	County	Socorro	Socorro	Valencia	Valencia
Formation		Qt	Qt	QTsf	Qe
Rock Type		sand and gravel	sand and gravel	sand and gravel	sand
Source Rock (Gravel)		various	various	limestone	-
Quality of Material		fair	fair	good	good
Thickness of Material		12'	13' plus	10' plus	6'
Thickness of Cap (Caliche)		-	-	-	-
Material Underlying Formation		clay	silt and clay	clay	sandstone @ depth
Vegetation		cacti and grass	cacti and grass	grass	grass
Local Terrain		hilly	dissected terraces	slope	rolling
Thickness of Overburden		1-4'	1-6'	1-5'	0-2'
P. I. (Overburden)		8	6	N.P.	N.P.
Estimated Quantity (cu. yds.)		100,000	100,000	200,000	100,000
Los Angeles Wear		28.8	29.0	24.4	S.E. = 49.0
Soundness Loss		1.1	3.0	0.5	-
Average Maximum Size		3"	3"	16"	-
% Retained on 2" Sieve		18	15	25	-
Pit Average % Passing	Crushed to:	1"	1"	2"	as received
	2"	-	-	100	-
	1"	100	100	71	-
	½"	68	81	53	10:100
	No. 4	47	57	37	40:96
	No. 10	31	38	31	80:67
	No. 200	2	3	2	200:25
Plasticity Index		N.P.	N.P.	N.P.	N.P.

Remarks:

MATERIAL PIT SUMMARY

Pit Number		57133	57136	57143	6401
Location	Section	SW31	Not sectionalized	Not sectionalized	Not sectionalized
	Township & Range	7N 3E	San Clemente Grant	Tome claim	Belen Grant
	County	Valencia	Valencia	Valencia	Valencia
Formation		Qt	Qb	QTsf	QTsf
Rock Type		sand and gravel	basalt and dacite	sand and gravel	sand and gravel
Source Rock (Gravel)		various	-	various	various
Quality of Material		good	good	good	good
Thickness of Material		10' plus	70' plus	12' plus	20' plus
Thickness of Cap (Caliche)		-	-	-	-
Material Underlying Formation		silt	silt	clay	clay
Vegetation		sage and grass	tumble weed and grass	grass	grass
Local Terrain		dissected terrace	side hill	dissected terrace	slope
Thickness of Overburden		2'	none	none	2'
P. I. (Overburden)		N.P.	-	-	N.P.
Estimated Quantity (cu. yds)		150,000	150,000	100,000	250,000
Los Angeles Wear		25.6	31.2	27.2	29.4
Soundness Loss		1.5	1.5	-	-
Average Maximum Size		6"	8'	3"	2"
% Retained on 2" Sieve		7	95	7	3
Pit Average % Passing	Crushed to:	2"	2"	2"	as received
	2"	100	100	93	100
	1"	70	54	90	96
	½"	40	28	69	88
	No. 4	31	15	51	68
	No. 10	26	10	10	50
	No. 200	1	2	0	6
Plasticity Index		N.P.	N.P.	N.P.	N.P.
Remarks:					

Pit Number		6468	6529	6739	6741
Location	Section	NW33	Not sectionalized	Not sectionalized	NE10
	Township & Range	8N 3E	San Clemente Grant	Pajarito Grant	8N 2E
	County	Valencia	Valencia	Bernalillo	Bernalillo
Formation		Qal	Qb	QTsf	Qp(2)
Rock Type		sand and gravel	dacite	sand and gravel	sand and gravel
Source Rock (Gravel)		various	-	various	limestone and various
Quality of Material		good	good	good	good
Thickness of Material		12' plus	12' plus	12' plus	14'
Thickness of Cap (Caliche)		-	-	-	-
Material Underlying Formation		clay and sand	-	clay	clay
Vegetation		grass	grass	grass	grass
Local Terrain		canyon bottom	mountainous	slope	mesa top
Thickness of Overburden		2-4'	6'	1-6'	2'
P. I. (Overburden)		5	N.P.	N.P.	6
Estimated Quantity (cu. yds.)		100,000	500,000	250,000	250,000
Los Angeles Wear		20.0	21.2	24.4	25.2
Soundness Loss		1.2	7.4	2.8	3.6
Average Maximum Size		3"	6"	3"	2"
% Retained on 2" Sieve		9	18	7	2
Pit Average % Passing	Crushed to:	as received	as received	as received	as received
	2"	86	52	89	86
	1"	82	37	79	69
	½"	74	32	68	55
	No. 4	57	27	58	41
	No. 10	43	24	51	34
	No. 200	6	11	1	3
Plasticity Index		N.P.	N.P.	N.P.	N.P.
Remarks:					

CONSTRUCTION MATERIALS INVENTORY

MATERIAL PIT SUMMARY

Pit Number		6822	7208	7301	0913
Location	Section	NE7	NW31	SE30	SW15
	Township & Range	6N 3E	7N 3E	7N 3F	8N 1W
	County	Valencia	Valencia	Valencia	Bernalillo
Formation		Qt	Qt	QTsf	Qe
Rock Type		sand and gravel	sand and gravel	sand and gravel	sand
Source Rock (Gravel)		various	various	various	-
Quality of Material		excellent	excellent	good	fair
Thickness of Material		10' plus	15'	14' plus	1-3'
Thickness of Cap (Caliche)		-	-	-	-
Material Underlying Formation		sandstone	sand	clay	siltstone
Vegetation		grass	grass	grass	grass
Local Terrain		hilly	rolling	rolling	hilly
Thickness of Overburden		0-3'	0-2'	0-2'	0-2'
P. I. (Overburden)		N.P.	N.P.	N.P.	N.P.
Estimated Quantity (cu. yds)		250,000	100,000	175,000	150,000
Los Angeles Wear		21.2	24.0	23.9	S.E. = 79
Soundness Loss		3.6	2.8	1.9	-
Average Maximum Size		3"	4"	4"	-
% Retained on 2" Sieve		6	10	10	-
Pit Average % Passing	Crushed to:	as received	as received	as received	as received
	2"	94	88	87	
	1"	75	86	77	
	½"	65	77	61	10:100
	No. 4	57	65	43	40:98
	No. 10	53	53	20	80:58
	No. 200	4	4	4	200:10
Plasticity Index		N.P.	N.P.	N.P.	N.P.
Remarks:					

Pit Number		0914	0915	0916	0917
Location	Section	NE18	SE32	NW12	Not sectionalized
	Township & Range	8N 1E	9N 3E	8N 4E	La de Padilla Grant
	County	Bernalillo	Bernalillo	Bernalillo	Valencia
Formation		Qc	QTsf	Psa	Qal
Rock Type		scoria and cinders	coarse sand	limestone	qravel
Source Rock (Gravel)		-	various	-	various
Quality of Material		qood	qood	qood	poor
Thickness of Material		50'plus	6-10'	10'	5' plus
Thickness of Cap (Caliche)		-	-	-	-
Material Underlying Formation		dacite @ depth	clay	shale	clay
Vegetation		-	qrass	qrass and trees	saqe and qrass
Local Terrain		mountainous	dissected slope	mountainous	sloping plain
Thickness of Overburden		-	0-2'	-	6'
P. I. (Overburden)		-	N.P.	-	N.P.
Estimated Quantity (cu. yds.)		300,000	300,000	500,000	15,000 plus
Los Angeles Wear		48.4	25.2	37.8	26.4
Soundness Loss		5.7	-	12.9	-
Average Maximum Size		-	3/4"	-	6"
% Retained on 2" Sieve		-	none	-	30
Pit Average % Passing	Crushed to:	1"	as received	2"	as received
	2"	-	-	100	65
	1"	100	100	58	54
	½"	51	94	26	45
	No. 4	30	79	12	34
	No. 10	22	66	7	21
	No. 200	3	1	1	8
Plasticity Index		N.P.	N.P.	N.P.	17
Remarks:					

CONSTRUCTION MATERIALS INVENTORY

MATERIAL PIT SUMMARY

Pit Number		0918	0919	0920	0921
Location	Section	SE12	Not sectionalized	Not sectionalized	Not sectionalized
	Township & Range	6N 2W	Tome claim	Tome Claim	Tome claim
	County	Valencia	Valencia	Valencia	Valencia
Formation		Ti	Psa	p€q	Oaf
Rock Type		diorite w/basalt	limestone	quartzite	gravel
Source Rock (Gravel)		-	-	-	granite and various
Quality of Material		good	good	good	good
Thickness of Material		2-10'	10' plus	75'	25' plus
Thickness of Cap (Caliche)		-	-	-	-
Material Underlying Formation		sandstone	shale	-	-
Vegetation		grass	greasewood	trees	grass and trees
Local Terrain		hilly	hilly	mountainous	mountainous
Thickness of Overburden		0-2'	0-2'	-	0-2'
P. I. (Overburden)		N.P.	6 plus	-	N.P.
Estimated Quantity (cu. yds)		175,000	200,000	500,000	175,000
Los Angeles Wear		15.1	35.2	19.2	19.7
Soundness Loss		2.5	25.8	3.8	6.1
Average Maximum Size		-	-	-	6"
% Retained on 2" Sieve		-	-	-	15
Pit Average % Passing	Crushed to:	1"	1"	1"	2"
	2"	-	-	-	100
	1"	100	100	100	57
	½"	48	65	94	25
	No. 4	19	23	17	11
	No. 10	9	13	9	6
	No. 200	2	3	1	2
Plasticity Index		N.P.	N.P.	N.P.	N.P.

Remarks:

Pit Number
Location: Section; Township & Range; County
Formation
Rock Type
Source Rock (Gravel)
Quality of Material
Thickness of Material
Thickness of Cap (Caliche)
Material Underlying Formation
Vegetation
Local Terrain
Thickness of Overburden
P. I. (Overburden)
Estimated Quantity (cu. yds.)
Los Angeles Wear
Soundness Loss
Average Maximum Size
% Retained on 2" Sieve
Pit Average % Passing: Crushed to:; 2"; 1"; ½"; No. 4; No. 10; No. 200
Plasticity Index
Remarks:

MATERIAL PIT SUMMARY

Pit Number		6822	7208	7301	0913
Location	Section	NE7	NW31	SE30	SW15
	Township & Range	6N 3E	7N 3E	7N 3E	8N 1W
	County	Valencia	Valencia	Valencia	Bernalillo
Formation		Qt	Qt	QTsf	Qe
Rock Type		sand and gravel	sand and gravel	sand and gravel	sand
Source Rock (Gravel)		various	various	various	-
Quality of Material		excellent	excellent	good	fair
Thickness of Material		10' plus	15'	14' plus	1-3'
Thickness of Cap (Caliche)		-	-	-	-
Material Underlying Formation		sandstone	sand	clay	siltstone
Vegetation		grass	grass	grass	grass
Local Terrain		hilly	rolling	rolling	hilly
Thickness of Overburden		0-3'	0-2'	0-2'	0-2'
P. I. (Overburden)		N.P.	N.P.	N.P.	N.P.
Estimated Quantity (cu. yds)		250,000	100,000	175,000	150,000
Los Angeles Wear		21.2	24.0	23.9	S.E. = 79
Soundness Loss		3.6	2.8	1.9	-
Average Maximum Size		3"	4"	4"	-
% Retained on 2" Sieve		6	10	10	-
Pit Average % Passing	Crushed to:	as received	as received	as received	as received
	2"	94	88	87	
	1"	75	86	77	
	½"	65	77	61	10:100
	No. 4	57	65	43	40:98
	No. 10	53	53	20	80:58
	No. 200	4	4	4	200:10
Plasticity Index		N.P.	N.P.	N.P.	N.P.

Remarks:

Pit Number		0914	0915	0916	0917
Location	Section	NE18	SE32	NW12	Not sectionalized
	Township & Range	8N 1E	9N 3E	8N 4E	La de Padilla Grant
	County	Bernalillo	Bernalillo	Bernalillo	Valencia
Formation		Qc	QTsf	Psa	Qal
Rock Type		scoria and cinders	coarse sand	limestone	qravel
Source Rock (Gravel)		-	various	-	various
Quality of Material		qood	qood	qood	poor
Thickness of Material		50'plus	6-10'	10'	5' plus
Thickness of Cap (Caliche)		-	-	-	-
Material Underlying Formation		dacite @ depth	clay	shale	clay
Vegetation		-	grass	qrass and trees	saqe and qrass
Local Terrain		mountainous	dissected slope	mountainous	slopinq plain
Thickness of Overburden		-	0-2'	-	6'
P. I. (Overburden)		-	N.P.	-	N.P.
Estimated Quantity (cu. yds.)		300,000	300,000	500,000	15,000 plus
Los Angeles Wear		48.4	25.2	37.8	26.4
Soundness Loss		5.7	-	12.9	-
Average Maximum Size		-	3/4"	-	6"
% Retained on 2" Sieve		-	none	-	30
Pit Average % Passing	Crushed to:	1"	as received	2"	as received
	2"	-	-	100	65
	1"	100	100	58	54
	½"	51	94	26	45
	No. 4	30	79	12	34
	No. 10	22	66	7	21
	No. 200	3	1	1	8
Plasticity Index		N.P.	N.P.	N.P.	17

Remarks:

EXPLANATION

QUAD No.54

- Developed Pit or Quarry
- Prospect Pit or Quarry
- Fault
- Downthrown side
- * Selected exploration site

QUATERNARY

- Qal — Alluvium
- Qe — Eolian sand
- Qld — Lake deposits
- Qab — Bolson deposits
- Qbd — Beach deposits
- Qp — Pediment deposits
- Qaf — Alluvial fan deposits
- Qop — Older Pediment deposits

PERMIAN

- Psa — San Andres Limestone
- Pg — Glorieta Sandstone
- Py — Yeso Formation
- Pa — Abo Formation

PENN-SYLVANIAN

- IPm — Madera Limestone
- IPs — Sandia Formation

PRECAMBRIAN

- p€g — Granite
- p€q — Quartzite
- p€m — Metamorphic rocks undivided

NEW MEXICO STATE HIGHWAY DEPARTMENT

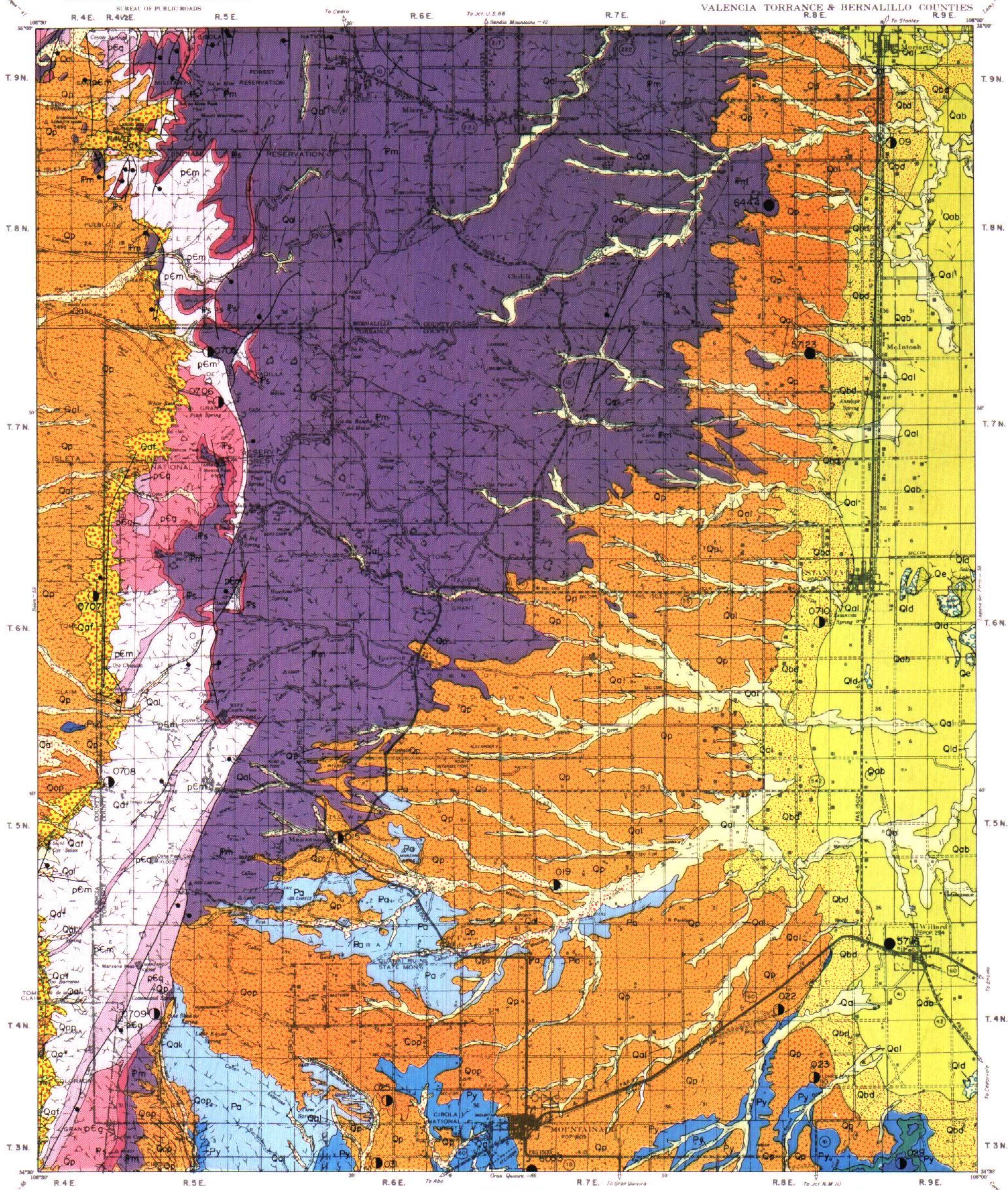
PLANNING AND PROGRAMMING DIVISION

BUREAU OF PUBLIC ROADS

GEOLOGY and AGGREGATE RESOURCES

MANZANO MOUNTAINS
QUADRANGLE – 54

VALENCIA TORRANCE & BERNALILLO COUNTIES



Control by U.S. Coast and Geodetic Survey, U.S. Geological Survey, U.S. Forest Service, Bureau of Land Management and Planning Division—Modified Conic Projection Standard Parallel 34½° North American Datum

DATE OF INVENTORY
GEOLOGY JAN. 1975

Longitude West from Greenwich

Scale $\frac{1}{190080}$ or 1 Inch = 3 Miles

DATE OF INVENTORY
BERNALILLO COUNTY 1964
TORRANCE COUNTY 1961
VALENCIA COUNTY 1962

MANZANO MOUNTAINS
QUADRANGLE

CONSTRUCTION MATERIALS INVENTORY

MATERIAL PIT SUMMARY

Pit Number		56106	57116	57123	6053
Location	Section	SW 1/4 16	SW 1/4 6	SE 1/4 3	SW 1/4 8
	Township & Range	7N 7E	4N 9E	7N 8E	3N 7E
	County	Torrance	Torrance	Torrance	Torrance
Formation		Pm	Qab	Qbd	Qal
Rock Type		limestone	sand	coarse sand	gravel
Source Rock (Gravel)		-	-	various	various
Quality of Material		good	fair	good	good
Thickness of Material		14' plus	7' plus	5' plus	14' plus
Thickness of Cap (Caliche)		-	-	-	-
Material Underlying Formation		shale	silt	silt & clay	silt
Vegetation		juniper	grass	grass & sage	juniper
Local Terrain		hilly	flat	rolling	hilly
Thickness of Overburden		0-2'	1'	1'	7'
P. I. (Overburden)		9	S.N.P.	11	11
Estimated Quantity (cu. yds)		unlimited	20,000	5,000 plus	100,000
Los Angeles Wear		28.8	-	-	32.4
Soundness Loss		2.7	-	-	10.9
Average Maximum Size		-	-	1"	3"
% Retained on 2" Sieve		-	-	1	10
Pit Average % Passing	Crushed to:	1"	as received	as received	as received
	2"	-	-	-	86
	1"	100	-	100	70
	½"	48	-	92	56
	No. 4	20	-	70	39
	No. 10	11	100	69	33
	No. 200	2	14	60	11
Plasticity Index		N.P.	S.N.P.	0-11	N.P.

Remarks:

56106: pit no 56105 in the area
57116: pit no 5611 in the area
57123: pit no 57122 in the area

Pit Number		6444	6445	009	015
Location	Section	NW 1/4 16	NW 1/4 24	E 1/3 1	not sectionalized
	Township & Range	8N 8E	7N 7E	8N 8E	Town Monzano Grant
	County	Torrance	Torrance	Torrance	Torrance
Formation		Pm	Pm	Qbd	Qp
Rock Type		limestone	limestone	coarse sand	gravel
Source Rock (Gravel)		-	-	various	schist, quartzite etc.
Quality of Material		good	good	fair	poor
Thickness of Material		5' lenses	14' plus	10'	12' plus
Thickness of Cap (Caliche)		-	-	-	-
Material Underlying Formation		shale	shale	silt & clay	silt & clay
Vegetation		pinon & sage	grass	sage & grass	juniper & grass
Local Terrain		hilly	rolling	beach line	hilly
Thickness of Overburden		1'	0-2'	2'	2-6'
P. I. (Overburden)		8	11	S.N.P.	7
Estimated Quantity (cu. yds.)		300,000	600,000	30,000 plus	300,000
Los Angeles Wear		28.0	30.0	23.8	45.2
Soundness Loss		8.6	1.16	3.8	19.9
Average Maximum Size		-	-	1/2"	2"
% Retained on 2" Sieve		-	-	-	10
Pit Average % Passing	Crushed to:	1"	1"	as received	as received
	2"	-	-	-	84
	1"	100	100	100	68
	½"	66	66	97	50
	No. 4	26	27	84	36
	No. 10	14	15	68	29
	No. 200	3	3	14	15
Plasticity Index		N.P.	N.P.	N.P.	N.P.

Remarks:

CONSTRUCTION MATERIALS INVENTORY

MATERIAL PIT SUMMARY

Pit Number		019	022	023	025
Location	Section	SE 1/4 29	E 1/2 16	S 1/2 27	E 1/2 33
	Township & Range	5N 7E	4N 8E	4N 8E	4N 6E
	County	Torrance	Torrance	Torrance	Torrance
Formation		Q p	Qp	Qp	Qgp
Rock Type		gravel	sand & gravel	sand & gravel	sand & gravel
Source Rock (Gravel)		quartzite	limestone & various	various	various
Quality of Material		good	good	fair	good
Thickness of Material		6' plus	10' plus	6'	15-20'
Thickness of Cap (Caliche)		-	-	-	-
Material Underlying Formation		silt & clay	silt & clay	silt & clay	silt & clay
Vegetation		grass	grass	juniper & grass	juniper & grass
Local Terrain		rolling	rolling	hilly	hilly
Thickness of Overburden		1-5'	0-4'	2'	0-4'
P. I. (Overburden)		13	8	7	11
Estimated Quantity (cu. yds)		20,000 plus	150,000 plus	50,000 plus	unlimited
Los Angeles Wear		29.6	28.8	31.6	27.6
Soundness Loss		2.3	4.8	9.2	12.2
Average Maximum Size		7"	8"	1"	4"
% Retained on 2" Sieve		11	18	less than 10	15
Pit Average % Passing	Crushed to:	as received	as received	as received	as received
	2"	80	88	91	73
	1"	69	81	83	54
	½"	53	72	71	37
	No. 4	40	51	45	26
	No. 10	33	35	28	20
	No. 200	16	14	6	6
Plasticity Index		N.P.	8-10	8	8

Remarks:

Pit Number		029	031	0705	0706
Location	Section	6 & 7	N 1/2 9	not sectionalized	not sectionalized
	Township & Range	3N 9E	3N 6E	Lo de Padilla Grant	Lo de Padilla Grant
	County	Torrance	Torrance	Torrance	Torrance
Formation		Psa	Qp	Ps	pEg
Rock Type		limestone	gravel	limestone	granite
Source Rock (Gravel)		-	various	-	-
Quality of Material		good	good	good	fair
Thickness of Material		6' plus	12-25'	45'	100' plus
Thickness of Cap (Caliche)		-	-	-	-
Material Underlying Formation		sandstone	silt & clay	metamorphics	-
Vegetation		juniper	juniper & grass	juniper	pine & maple
Local Terrain		mountainous	hilly	mountainous	mountainous
Thickness of Overburden		0-6'	1-6'	-	0-2'
P. I. (Overburden)		S.N.P.	6	-	S.N.P.
Estimated Quantity (cu. yds.)		unlimited	100,000 plus	400,000 plus	1,000,000 plus
Los Angeles Wear		32.8	28.4	22.3	27.8
Soundness Loss		20.5	2.5	7.1	8.4
Average Maximum Size		-	6"	-	-
% Retained on 2" Sieve		-	20	-	-
Pit Average % Passing	Crushed to:	1"	as received	1"	1"
	2"	-	78	-	-
	1"	100	64	100	100
	½"	52	48	58	48
	No. 4	23	32	20	19
	No. 10	14	26	10	6
	No. 200	3	10	2	1
Plasticity Index		N.P.	N.P.	S.N.P.	S.N.P.

Remarks:

CONSTRUCTION MATERIALS INVENTORY

MATERIAL PIT SUMMARY

Pit Number		0707	0708	0709	0710
Location	Section	not sectionalized	SW 1/4 7	SE 1/4 17	S 1/2 15
	Township & Range	Tome Grant	5N 5E	4N 5E	6N 8E
	County	Valencia	Torrance	Torrance	Torrance
Formation		Qaf	pЄm	pЄq	Qbd
Rock Type		gravel	granitic schist	quartzite	sand & gravel
Source Rock (Gravel)		various	-	-	limestone
Quality of Material		good	good	excellent	good
Thickness of Material		50' plus	85' plus	100' plus	6' plus
Thickness of Cap (Caliche)		-	-	-	-
Material Underlying Formation		-	-	-	sandstone conglomerate
Vegetation		juniper	juniper	pine	grass
Local Terrain		sloping	mountainous	mountainous	flat
Thickness of Overburden		0-2'	-	0-2'	0-2'
P. I. (Overburden)		N.P.	-	S,N,P,	6
Estimated Quantity (cu. yds)		565,000	unlimited	150,000 plus	40,000
Los Angeles Wear		27.6	27.5	22.8	24,0
Soundness Loss		23.2	4.8	1,8	9,8
Average Maximum Size		8"	-	-	1"
% Retained on 2" Sieve		42	-	-	4
Pit Average % Passing	Crushed to:	as received	1"	1"	as received
	2"	40	-	-	80
	1"	25	100	100	66
	½"	18	65	49	55
	No. 4	12	28	18	40
	No. 10	8	14	8	30
	No. 200	4	3	2	9
Plasticity Index		N.P.	N.P.	S,N.P.	6
Remarks:					

Pit Number	
Location	Section
	Township & Range
	County
Formation	
Rock Type	
Source Rock (Gravel)	
Quality of Material	
Thickness of Material	
Thickness of Cap (Caliche)	
Material Underlying Formation	
Vegetation	
Local Terrain	
Thickness of Overburden	
P. I. (Overburden)	
Estimated Quantity (cu. yds.)	
Los Angeles Wear	
Soundness Loss	
Average Maximum Size	
% Retained on 2" Sieve	
Pit Average % Passing	Crushed to:
	2"
	1"
	½"
	No. 4
	No. 10
	No. 200
Plasticity Index	
Remarks:	

EXPLANATION

QUAD No. 65

QUATERNARY

- Qaf — Alluvium
- Qfp — Floodplain deposits
- Qe — Eolian deposits
- Qab — Bolson deposits
- Qaa — Alluvial Aprons
- Qp — Pediment deposits
- Qip — Intermediate Pediment deposits
- Qop — Older Pediment deposits
- Qaf — Alluvial fan deposits
- Ql — Landslide Debris
- Qb — Basalt (Youngest or undiff.)
- QTsf — Santa Fe Formation
- QTsv — Santa Fe Volcanics

TERTIARY

- Td — Datil Volcanics undifferentiated
- Tb — Basalt
- Tpt — Popatosa Volcanics
- Ti — Intrusive rocks undivided

TRIASSIC

- R — Triassic rocks undivided

CRETACEOUS

- Kd — Dakota Sandstone
- K — Cretaceous undifferentiated

PERMIAN

- Psa — San Andres Limestone
- Py — Yeso Formation
- Pa — Abo Formation
- P — Lower Permian undivided

PENNSYLVANIAN

- IP — Pennsylvanian rock undivided

PRECAMBRIAN

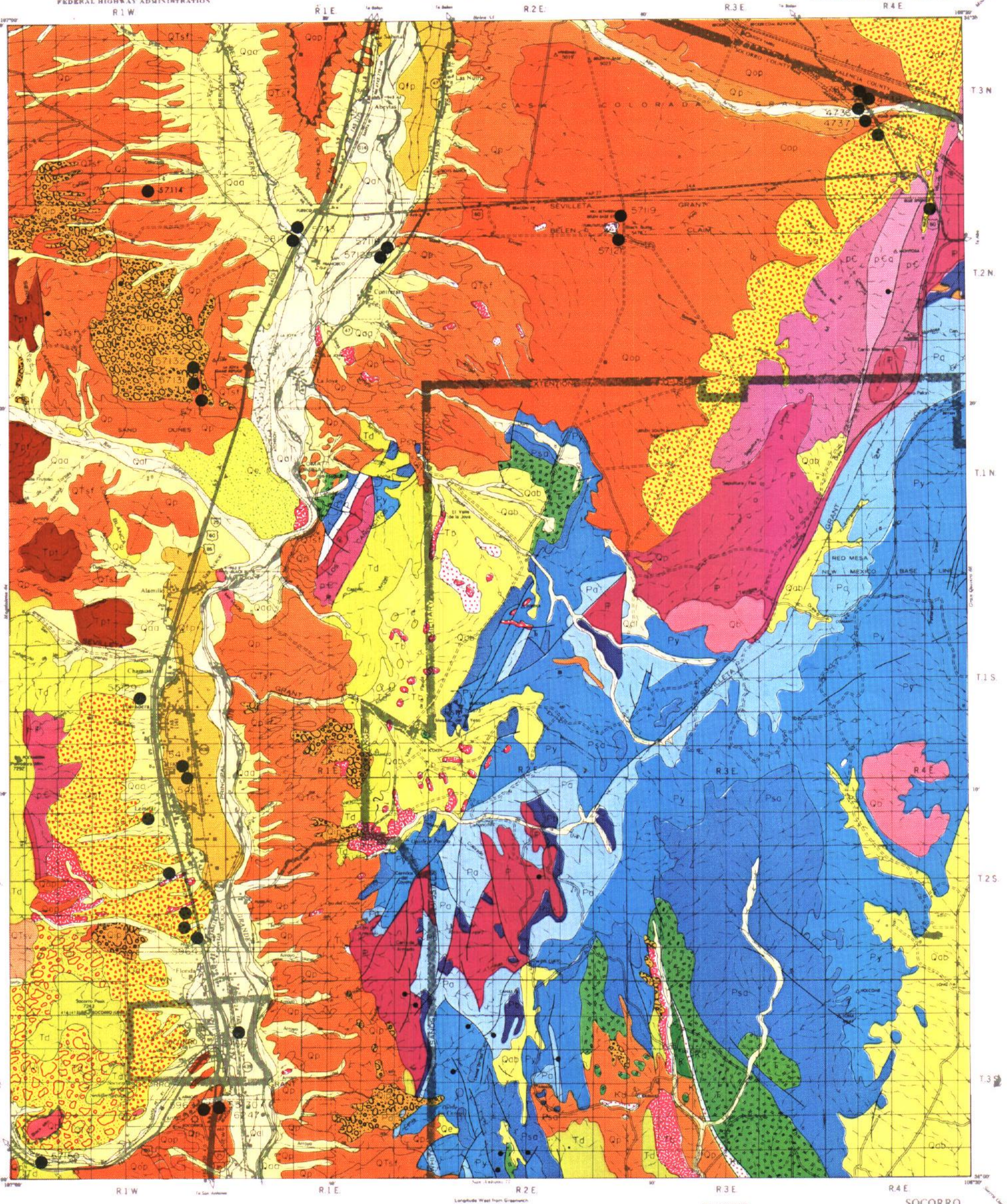
- p€ — Precambrian undivided
- p€q — Quartzite

- Established pit or quarry
- Prospect pit or quarry
- Fault — downthrown side
- Anticline
- Syncline

NEW MEXICO STATE HIGHWAY DEPARTMENT
PLANNING AND PROGRAMMING DIVISION
FEDERAL HIGHWAY ADMINISTRATION

GEOLOGY and AGGREGATE RESOURCES

SOCORRO QUADRANGLE-65
VALENCIA & SOCORRO COUNTIES



Control by National Geodetic Survey, U.S. Geological Survey,
U.S. Forest Service, Bureau of Land Management and Planning Division
Modified Conic Projection Standard Parallel 34°N North American Datum

DATE OF INVENTORY
GEOLOGY NOV. 1977
AGGREGATE RESOURCES NOV. 1977

Scale $\frac{1}{190080}$ or 1 Inch = 3 Miles

DATE OF INVENTORY
SOCORRO COUNTY 1968
VALENCIA COUNTY 1969

SOCORRO
QUADRANGLE
65

CONSTRUCTION MATERIALS INVENTORY

MATERIAL PIT SUMMARY

Pit Number		4736	4737	4738	5401
Location	Section	Not Sectionalized	Not Sectionalized	Not Sectionalized	SW1/4 Sec. 35
	Township & Range	3N 4E	3N 4E	3N 4E	1S 1W
	County	Socorro	Socorro	Socorro	Socorro
Formation		Qal	Qal	Qp	Qfp
Rock Type		sand & gravel	sand	sand & gravel	sand & gravel
Source Rock (Gravel)		limestone & various			various
Quality of Material		good			good
Thickness of Material		6'			5'
Thickness of Cap (Caliche)					
Material Underlying Formation		sand			sand
Vegetation		grass			grass
Local Terrain		rolling			river bottom
Thickness of Overburden		0-2'			0-2'
P. I. (Overburden)		N.P.			N.P.
Estimated Quantity (cu. yds)		150,000			100,000
Los Angeles Wear					
Soundness Loss					
Average Maximum Size		8"			2"
% Retained on 2" Sieve		20			0
Pit Average % Passing	Crushed to:				
	2"				
	1"				
	½"				
	No. 4				
	No. 10				
	No. 200				
Plasticity Index					

Remarks:

Pit Number		5402	55112	55127	55129
Location	Section	SW1/4 Sec. 35	Not Sectionalized	Sec. 23 & 26	S1/2 Sec. 22
	Township & Range	1S 1W	3N 4E	2S 1W	1S 1W
	County	Socorro	Socorro	Socorro	Socorro
Formation		Qfp	Qaf	Qaf	Qaa
Rock Type		sand & gravel	sand	sand & gravel	sand & gravel
Source Rock (Gravel)		various	various	various	various
Quality of Material		good	good	good	good
Thickness of Material		6'	10'	6-12	6' plus
Thickness of Cap (Caliche)					
Material Underlying Formation		sand	sand	silt, sand & gravel	sand
Vegetation		grass	grass	grass & greaswood	grass & greasewood
Local Terrain		river bottom	slope	rolling	rolling
Thickness of Overburden		0-2'	0-2'	1-6'	0-2'
P. I. (Overburden)		N.P.	N.P.	10	0-10
Estimated Quantity (cu. yds.)		100,000	200,000	500,000 plus	100,000
Los Angeles Wear				22.8	
Soundness Loss					
Average Maximum Size		2"	4"	5"	6"
% Retained on 2" Sieve		3	12	8	13
Pit Average % Passing	Crushed to:			as received	
	2"			72	
	1"			45	
	½"			32	
	No. 4			21	
	No. 10			16	
	No. 200			4	
Plasticity Index				N.P.	

Remarks:

CONSTRUCTION MATERIALS INVENTORY

MATERIAL PIT SUMMARY

Pit Number		55130	5673	5717	5759
Location	Section	Not Sectionalized	NE1/4 Sec. 10	Not Sectionalized	Not Sectionalized
	Township & Range	City of Socorro Grant	2S 1W	1N 1W	Las Vegas Grant
	County	Socorro	Socorro	Socorro	Socorro
Formation		Qp	Qaf	Qp	Qfp
Rock Type		sand & gravel	sand & gravel	sand & gravel	sand & gravel
Source Rock (Gravel)		various	various	various	various
Quality of Material		good	excellent	good	good
Thickness of Material		9-10'	4-12'	2-8'	10'
Thickness of Cap (Caliche)					
Material Underlying Formation		sand, soil, gravel	sand & gravel	sand	sand & gravel
Vegetation		grass & greasewood	grass & greaswood	grass & greasewood	grass
Local Terrain		arroyo bank	rolling	rolling	hill
Thickness of Overburden		0-1'	1.6-2.5	5-3'	0-2'
P. I. (Overburden)		N.P.	9	N.P.	0-10
Estimated Quantity (cu. yds)		300,000 plus	200,000 plus	100,000	50,000 plus
Los Angeles Wear		19.2	25.6	32.0	
Soundness Loss			4.3		
Average Maximum Size		6"	5"	5"	3"
% Retained on 2" Sieve		11	8	10	6
Pit Average % Passing	Crushed to:	3/4"	as received	as received	
	2"		90	93	
	1"		81	85	
	½"	72	68	79	
	No. 4	40	49	67	
	No. 10	26	33	55	
	No. 200	6	7	12	
Plasticity Index		N.P.	8	N.P.	
Remarks:					

Pit Number		5743	5786	5789	57114
Location	Section	Not Sectionalized	Not Sectionalized	NW1/4 Sec. 16	SE1/4 Sec. 3
	Township & Range	Sevilleta Grant	Sevilleta Grant	9S 32E	2N 1W
	County	Socorro	Socorro	Socorro	Socorro
Formation		Qaa	Qaf	Qop	Qp
Rock Type		sandy silt	sand & gravel	sand	sand & gravel
Source Rock (Gravel)		various	various	various	quartzite
Quality of Material		fair	good	good	good
Thickness of Material		6'	4-12'	0-6'	2-14'
Thickness of Cap (Caliche)					
Material Underlying Formation		silt	rock, clay, gravel	sand	soil & gravel
Vegetation		grass	grass & greasewood	grass & greasewood	grass
Local Terrain		flat	mountainous	hilly	hilly
Thickness of Overburden		1-3'	0-1.7'	0	2-4'
P. I. (Overburden)		N.P.	N.P. - 10		6
Estimated Quantity (cu. yds.)		5,000	250,000	150,000	150,000 plus
Los Angeles Wear			30.8		27.6
Soundness Loss					
Average Maximum Size		No. 10 screen	1.5"	No. 4 screen	4"
% Retained on 2" Sieve		0	0	0	11
Pit Average % Passing	Crushed to:		as received		as received
	2"		100		92
	1"		93		81
	½"		84		72
	No. 4		51		62
	No. 10		31		51
	No. 200		5		18
Plasticity Index			N.P.		8
Remarks:					

CONSTRUCTION MATERIALS INVENTORY

MATERIAL PIT SUMMARY

Pit Number		5963	5964	6247	6810
Location	Section	Not Sectionalized	SW1/4 Sec. 26	SW1/4 Sec. 27	S1/2 Sec. 14
	Township & Range	Socorro Grant	2S 1W	Socorro Grant	2S 1W
	County	Socorro	Socorro	Socorro	Socorro
Formation		Qp	Qaa	Qp	Qaa
Rock Type		sand & gravel	sand & gravel	sand & gravel	silty sand & gravel
Source Rock (Gravel)		various	various	various	various
Quality of Material		excellent	good	excellent	excellent
Thickness of Material		8-11'	10'	11'	10'
Thickness of Cap (Caliche)					
Material Underlying Formation		sand & gravel	silt	sand & gravel	silt
Vegetation		greasewood	greasewood	greasewood	grass & greasewood
Local Terrain		hill	hill	hill	arroyo bottom
Thickness of Overburden		0	2'	0	1-2'
P. I. (Overburden)		0	N.P.	0	N.P.
Estimated Quantity (cu. yds)		150,000 plus	250,000	300,000 plus	400,000 plus
Los Angeles Wear		20.0		16.9	
Soundness Loss				2.0	
Average Maximum Size		5"	7"	5"	6"
% Retained on 2" Sieve		30	25	30	21
Pit Average % Passing	Crushed to:	as received		as received	
	2"	63		57	
	1"	45		42	
	½"	34		31	
	No. 4	24		23	
	No. 10	18		19	
	No. 200	2		2	
Plasticity Index		N.P.		N.P.	

Remarks:

Pit Number		6811
Location	Section	Sec. 26
	Township & Range	2S 1W
	County	Socorro
Formation		Qaf
Rock Type		silt, rock, gravel
Source Rock (Gravel)		various
Quality of Material		good
Thickness of Material		8-12'
Thickness of Cap (Caliche)		
Material Underlying Formation		silt & gravel
Vegetation		greesewood
Local Terrain		gravel ridge
Thickness of Overburden		2-3'
P. I. (Overburden)		N.P.
Estimated Quantity (cu. yds.)		500,000 plus
Los Angeles Wear		18.8
Soundness Loss		
Average Maximum Size		7"
% Retained on 2" Sieve		25
Pit Average % Passing	Crushed to:	as received
	2"	78
	1"	68
	½"	57
	No. 4	39
	No. 10	28
	No. 200	2
Plasticity Index		N.P.

Remarks:

CONSTRUCTION MATERIALS INVENTORY

QUADRANGLE PAGE 65(4)

MATERIAL PIT SUMMARY

Pit Number		57118	57119	57120	57121
Location	Section	Not Sectionalized	Not Sectionalized	Not Sectionalized	Not Sectionalized
	Township & Range	2N 1E	2N 2E	2N 1E	2N 1E
	County	Socorro	Socorro	Socorro	Socorro
Formation		Qal	Ti	Qal	Ti
Rock Type		sand & gravel		sand	
Source Rock (Gravel)		various		various	
Quality of Material		good	good	good	good
Thickness of Material		5'	20' plus	4'	50' plus
Thickness of Cap (Caliche)					
Material Underlying Formation		silt & sand		sand	
Vegetation		grass	grass & greasewood	grass	grass & greasewood
Local Terrain		arroyo bottom	mountainous	river bank	mountain
Thickness of Overburden		0-3'		0-2'	
P. I. (Overburden)		N.P.		N.P.	
Estimated Quantity (cu. yds)		100,000 plus	250,000 plus	100,000 plus	500,000
Los Angeles Wear					
Soundness Loss					
Average Maximum Size		2"		2"	
% Retained on 2" Sieve		3		3	
Pit Average % Passing	Crushed to:				
	2"				
	1"				
	½"				
	No. 4				
	No. 10				
	No. 200				
Plasticity Index					
Remarks:					

Pit Number		57131	57132	57150	5817
Location	Section	Not Sectionalized	Not Sectionalized	N1/2 Sec. 31	Not Sectionalized
	Township & Range	Sevilleta Grant	Sevilleta Grant	3S 1W	Sevilleta Grant
	County	Socorro	Socorro	Socorro	Socorro
Formation		Qip	Qip	Qt	Qaa
Rock Type		sand & gravel	sand & gravel	gravel	silt
Source Rock (Gravel)		various	various	igneous & various	various
Quality of Material		good	good	good	fair
Thickness of Material		12-16'	12-14'	6-10'	6'
Thickness of Cap (Caliche)					
Material Underlying Formation		clay & sandstone	sand & gravel	soil & gravel	silt
Vegetation		grass	grass	grass	grass
Local Terrain		hilly	hilly	arroyo bank	flat
Thickness of Overburden		1-3'	2-4'	0-4'	1-3'
P. I. (Overburden)		N.P - 10	9	N.P.	N.P.
Estimated Quantity (cu. yds.)		300,000 plus	300,000 plus	300,000 plus	10,000
Los Angeles Wear		26.0	28.0	23.2 21.2	
Soundness Loss					
Average Maximum Size		2"	2"	10"	2"
% Retained on 2" Sieve		0	0	35	0
Pit Average % Passing	Crushed to:	as received	as received	as received	
	2"	100	95	48	
	1"	92	84	37	
	½"	84	76	30	
	No. 4	67	63	23	
	No. 10	54	52	18	
	No. 200	6	10	2	
Plasticity Index		N.P.	N.P.	N.P.	
Remarks:					