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Age of the Tahoe moraine at Bloody Canyon, Mono County, California, based on tephrochronology

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**Age of the Tahoe moraine at Bloody canyon, Mono County,
California, based on tephrochronology**

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San Jose State University, 1993

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AGE OF THE TAHOE MORaine AT BLOODY CANYON, MONO COUNTY,
CALIFORNIA, BASED ON TEPHROCHRONOLOGY

A Thesis
Presented to
The Faculty of the Department of Geology
San Jose State University

In Partial Fulfillment
of the Requirements for the Degree
Master of Science

by
Stan Soles
December, 1993

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ABSTRACT

AGE OF THE TAHOE MORaine AT BLOODY CANYON, MONO COUNTY, CALIFORNIA, BASED ON TEPHROCHRONOLOGY

by Stan Soles

The age of the Tahoe moraine at Bloody Canyon has been the subject of controversy for many years. This study represents the most recent effort at a numerical age and employed a new approach - tephrochronology. The major attribute to this approach is that it does not base a conclusion on materials with uncertainties that are impossible to quantify (as do earlier dating methods).

This study found that (1) the total amount of glass shards decreased from ~90% at the surface to less than 1% at depths of 2.5 m in the till; (2) shards correlated to late Holocene tephra layers were present throughout the 2.5-m sampling interval; late Pleistocene shards (65,000 - 90,000 y BP) are present sporadically at various depths in the soil profile.

This study concludes that (1) the soil formed on the Tahoe moraine is at least 65,000 - 90,000 years in age; and (2) translocation of fine particles must extend to at least 2.5 m in the Tahoe till.

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Hats off to those who wrestled with the complexities of the eastern Sierran glaciation before this study and best of luck to those who will surely follow. Thanks to K.R. "Pitbull" Nehring for yeoman duty on the stupid end of a shovel and to J. Yount, R. Burke, A. Gillespie, and J. Harden for discussions and ideas. Special thanks to the J. O. Davis Foundation. I couldn't say enough about E. Wan and C. Meyer. Mucho thanks to A. M. Sarna-Wojcicki for the ideas, patience, and sharing his knowledge with me. I wouldn't have made it without Candy. D. Harden, who thought of me, and put up with me, I could never thank enough (thanks $\times 10^{10}$). I would like to dedicate the whole shebang to Barney, the best pal a guy could have ever had. Additional inspiration from the greatest military mind ever, Lieutenant General T.J. "Stonewall" Jackson (1824-1863) ". . . Never give council to your fears."

Although many participated in and contributed to this project the author alone is responsible for any errors, omissions, or breaks in logic.

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ABSTRACT

The age of the Tahoe moraines on the east side of the Sierra Nevada has been a subject of considerable discussion over about the last 60 years. Two schools of thought prevail: (1) that the moraines were formed ~65,000 to ~75,000 y BP, roughly equivalent in age to deep-sea oxygen isotope stage four, or (2) that they were formed ~135,000 to ~175,000 y BP, roughly equivalent to deep-sea oxygen isotope stage six. A major reason for this uncertainty is that most available dating techniques have large errors or poor reproducibility when applied to moraines and tills within this age range.

This study attempted to bracket the age of the Tahoe moraine at Bloody Canyon by (1) searching for volcanic shards in the soil formed on the moraine and in the fine fraction of the till below the soil; (2) physically separating the shards and analyzing them by electron-microprobe; and (3) comparing the chemical composition of the shards to those in tephra layers of known age. Four pits were dug near the crest of the moraine and sampled continuously in intervals of 15 cm to depths of 2.5 m. We found that (1) the total amount of shards decreased from about 90% at the surface to considerably less than 1% in the deepest samples; (2) shards correlated to late Holocene tephra layers were present throughout the 2.5-m depth interval; (3) shards correlated to late Pleistocene tephra layers are present sporadically at various depths in the profile; and (4) some of these shards correlate to tephra

layers present in Walker Lake, Nevada, at depths of 65 to 80 m. At Walker Lake, these layers are constrained by uranium-series ages to between ~65,000 and ~90,000 y BP. A few shards (<<1%) of the early Pleistocene Bishop Tuff (760,000 y BP) are found in the soil matrix. These are believed to be reworked shards brought in by wind from extensive exposures of this unit to the east and south of the study site. No Bishop Ash shards were found in the till matrix.

This study concludes that (1) the soil formed on the Tahoe moraine is at least 65,000-90,000 years in age, and thus that the underlying till must be equivalent to at least oxygen-isotope stage six, or older; and (2) translocation or mechanical mixing of fine particles from the surface of the soil must extend to at least 2.5 m in the Tahoe till.

INTRODUCTION

Since the recognition of glacial features and deposits on the eastern slope of the Sierra Nevada about 100 years ago, a veritable army of workers has attempted to correlate the associated glacial episodes to the continental glacial advances and deep-sea oxygen isotope records. Many past studies have temporally correlated the Tahoe glacial advance with the Early Wisconsinan continental glaciation, and with deep-sea oxygen isotope stage four (~55,000 to ~70,000 y BP); other studies have equated the Tahoe glaciation with the Illinoian continental glaciation and with deep-sea oxygen isotope stage six (~125,000 to ~185,000 y BP) (Fig. 1). (It should be noted that there is disagreement as to the time spans of the oxygen isotope stages and the continental glaciations; additionally, different spellings for the continental glacial periods are also used.) The eastern slope of the Sierra Nevada provides a unique natural laboratory for the study of Quaternary glaciation because moraines have been well preserved in the semi-arid climate of the region. This study attempts to obtain an accurate age for the Tahoe moraine at Bloody Canyon through the use of tephrochronology. Although this study focuses on the Tahoe glacial episode, many of the other major glacial events of the region are discussed because they are relevant to establishing the age of the Tahoe moraine.

GLACIAL- INTERGLA- CIAL PERIOD	TIME SCALE (YRS)	OXYGEN ISOTOPE STAGE
Neoglacial	10,000-	1
Late Wisconsin	35,000-	2
Middle Wisconsin	65,000-	3
Early Wisconsin	75,000-	4
Sangamon Inter- glacial	135,000-	5
Illinoian	180,000-	6
		7

Figure 1. Chart displaying the age intervals of the various continental glacial events as discussed in the text and their tentative correlation to the deep-sea oxygen isotope chronology. This investigation is a pilot study to determine if this method can be applied to determine the glacial chronology in this area.

The Study Area

Bloody Canyon is approximately 7 kilometers southwest of the town of Lee Vining, California, at the base of the steep, east-facing escarpment of the eastern Sierra Nevada (Figs. 2 and 3). The canyon trends northeast-southwest and is bounded by parallel nested linear ridges typical of multiple glacial episodes. In addition, it displays the rather rare cross-cutting relationships of younger through older ridges that provide vital relative-age information to their glacial history. Bloody Canyon is the drainage basin of Walker Creek which eventually flows to Mono Lake.

The bedrock geology was mapped by Kistler (1966). Among the intrusive rocks in the canyon, only the quartz monzonite of the Lee Vining Canyon pluton is widely exposed. A major aplitic zone within the pluton is found on the floor and northern wall of the canyon. Additionally, small remnants of Paleozoic metamorphic rocks are exposed on some of the higher peaks.

With regard to the Quaternary geology of the area, the most distinctive and unusual feature of the study site is a large set of lateral moraines extending obliquely to the east-northeast from under the younger right lateral Tahoe moraine (Figs. 2 and 3). These moraines are referred to as Mono Basin by a number of workers. This area has been designated the type locality for the Mono Basin moraines. The valley between these two moraines is called Sawmill Canyon (which should not be confused with another Sawmill

Figure 2. Site location map of Bloody Canyon, Mono County, California. Topographic base is Mono Craters, California, 15' quadrangle.

Figure 3. Aerial photograph of moraines of the Sawmill Canyon-Bloody Canyon area, illustrating the cross-cutting relationship between the Mono Basin and Tahoe moraines and the nested relationship of the Tahoe, Tenaya, and Tioga moraines. Photograph courtesy of D. Harden.

Canyon, in Inyo County, California, approximately 125 km south of the Bloody Canyon study site).

The weather in the area is relatively arid. Precipitation falls mostly in the winter months as snow in the higher elevations and as snow and rain in the lower elevations. The mean annual precipitation recorded at Mono Lake (elevation 1987 m) is 33.6 cm (13.2 in). Temperatures can range from -13°C (8°F) in the winter to over 40°C (100°F) in the summer months (U.S. Weather Bureau, 1964).

Vegetation at the study site primarily consists of the Great Basin sage community (sagebrush, rabbit brush, horsebrush, and shadscale); however, in the higher elevations, mountain mahogany, juniper, cedar, and a variety of pine trees become common (Storer and Usinger, 1963).

Hypothesis

The hypothesis this investigation will pursue is that the numerous explosive volcanic eruptions that have blanketed the study area with tephra in the past have also been deposited on the glaciers and associated moraines which occupied Bloody Canyon during the Tahoe glacial stage. With seasonal and longer term fluctuations of the climate, and consequent stadial advances and retreats of the glaciers, tephra shards would become incorporated into the till of the moraine. If volcanic shards of previously analyzed and dated tephra layers could be found in the Tahoe moraine at Bloody Canyon, they would provide a limiting maximum age for the Tahoe moraine. Conversely, tephra erupted after the moraine had been formed would cover its surface, and some of this material should be incorporated into the soil profile

formed on the moraine. Tephra layers or disseminated volcanic glass shards found in the soil developed on the Tahoe till could thus provide a limiting minimum age for the moraine. The youngest identified tephra within the till matrix, and the oldest identified tephra within the soil profile, would thus constrain the age of the moraine.

The right lateral Tahoe moraine at Bloody Canyon was chosen for this study because the moraine is in an excellent state of preservation, having original constructional morphology that has been changed very little by subsequent erosion. Moreover, the study area is close to several explosive volcanic source areas that have been active in late Quaternary time; these are the Mono Craters, the Inyo Craters, and Mammoth Mountain (Fig. 4). Many tephra layers from these and other sources have been identified at numerous sites in close proximity to Bloody Canyon (Lajoie, 1968; Davis, 1978; Lajoie, unpublished data, 1988; Sarna-Wojcicki, and others, 1988a; Sarna-Wojcicki and Davis, 1991; Sarna-Wojcicki and Pringle, 1992). Therefore, a large body of data exists that provides opportunities for dating the Tahoe moraine by tephrochronology.

Figure 4. Display of the close proximity of the Bloody Canyon study site to the Mono Craters, Inyo Craters, and Mammoth Mountain volcanic source areas. Topographic base is the Mariposa, California, 1:250,000 sheet.

PREVIOUS WORK

After a brief review of the published literature dealing with eastern Sierran glaciation, and in particular the glacial features preserved at Bloody Canyon, one realizes that the numerous workers who have studied them strongly disagree on the chronology of events that are represented there. The disagreement pertains not only to the numerical age of the various moraines at Bloody Canyon, but also to which moraine represents which eastern Sierra Nevada glacial event, and how many episodes of glaciation are represented at the study site. For this reason a brief chronological development of the studies of the glacial features preserved at Bloody Canyon and the eastern slope of the Sierra Nevada is included. The reader is referred to Figure 5 for a summation of the following discussion.

Early Studies at Bloody Canyon Employing Inter-Valley Correlations and Relative Dating Techniques

The earliest published reports of the nested and cross-cutting morphological relationships of the moraines at Bloody Canyon are by W.J. McGee (1885) and I.C. Russell (1887). Both described the moraines in fair detail, but did not attempt to correlate them to the continental glacial events. Russell observed that the moraines must be progressively older away from the valley axis.

The first worker to systematically study the moraines at Bloody Canyon, to ascribe relative ages to them on the basis of physical observations, and to attempt to correlate them to the continental glacial-moraine sequence of the central United States was Elliot Blackwelder (1931). He

used semi-quantitative, relative age dating techniques based on the premise that certain weathering parameters are time dependent, and therefore can be used to distinguish separate episodes of deposition. Blackwelder employed several lines of evidence: the extent of soil development, the nested and cross-cutting relationships of the moraines, the degree of erosion of moraines, and the degree of weathering of surficial boulders. Blackwelder used these multiple lines of evidence to arrive at his conclusions regarding the timing and sequence of glaciation on the east slope of the Sierra Nevada. He introduced the technique of using relative frequencies of boulders exposed on moraine crests and the "granite weathering ratio" as two useful semi-quantitative relative dating techniques. The first technique relied on the observation that younger moraines tend to have more exposed boulders on the surface than older moraines. The second technique, and the one he regarded as the most reliable, depended on the progressive weathering of coarse clasts in progressively older deposits. Blackwelder grouped granitic boulders from moraine crests into three classes, according to their degree of visible weathering: almost weathered, notably weathered but competent, and cavernous or rotten. Variations among moraines in the relative frequencies of boulders in the three groups was the measure of relative age. Using these criteria, Blackwelder distinguished four glaciations, which he named, from youngest to oldest, the Tioga, Tahoe, Sherwin, and McGee. He correlated the Tioga and Tahoe with the late and early Wisconsin stages, and the Sherwin and McGee with the Illinoian stage (Fig. 5). At the time of Blackwelder's

(1931) studies, the ages of the continental glaciations were not well defined. It was not until several decades after Blackwelder's work at Bloody Canyon that methods were developed which enabled the establishment of the continental glaciation chronosequence (for example, see Andrews and Miller, 1980). Currently, the late Wisconsin glacial stage is thought to have occurred between ~10,000 y and ~35,000 y BP (deep-sea oxygen isotope stage two) and the early Wisconsin, between ~65,000 y and ~75,000 y BP (deep-sea oxygen isotope stage four), respectively. The Illinoian continental glaciation is thought to have occurred ~132,000 y to ~302,000 y BP (deep-sea oxygen isotope stage six, seven, and late eight) (for example, see Lemke and others, 1965; Mickelson and others, 1983; Fullerton and Colton, 1986; Fullerton and Richmond, 1986) (Fig. 5). Oxygen isotope variations in foraminifera in deep-ocean sediments have been found to vary with ocean level changes. The ocean-level changes are related to the successive glacial/interglacial changes in climate that have occurred during the Quaternary (low SL equals a glacial or stadial period; high SL equals a interglacial or interstadial period) (Shackelton and Opdyke, 1973; Imbrie and others, 1984). These changes have now been numerically calibrated by magnetostratigraphy and radiocarbon dating of deep-ocean cores, and U/Th dating of corals of uplifted shorelines (Bloom and others, 1974), and those studying Alpine and continental glacial deposits are now trying to correlate these to the fairly well dated deep-ocean oxygen-isotope chronology.

Sharp and Birman (1963), Birman (1964), and Sharp

Glacial/Interglacial Chronology at Bloody Canyon from Various Studies

GLACIAL- INTERGLA- CIAL PERIOD	TIME SCALE (YRS)	OXYGEN ISOTOPE STAGE	BLACK- WELDER (1931)	SHARP & BIRMAN (1963)	BURKE & BIRKE- LAND (1979)	GILLESPIE (1982)	DORN (1987)	PHILLIPS (1990)
Neoglacial	10,000-	1						
Late Wisconsin	35,000-	2	TIOGA	TIOGA TENAYA	TIOGA	TIOGA	TIOGA	TIOGA TENAYA
Middle Wisconsin	65,000-	3				TENAYA		
Early Wisconsin	75,000-	4	TAHOE	TAHOE	TAHOE	TAHOE II		TAHOE II
Sangamon Inter- glacial	135,000-	5			 ?			
Illinoian	180,000-	6	SHERWIN	MONO BASIN		TAHOE I MONO BASIN(?)	TAHOE MONO BASIN	MONO BASIN
		7	McGEE					TAHOE I

Figure 5. Summary of the various studies at Bloody Canyon and the eastern slope of the Sierra Nevada as discussed in the text. Margins of error for the numerical age interpretations are not given.

(1969) refined and expanded the relative dating techniques of Blackwelder in their investigations at Bloody Canyon. They proposed the name Tenaya for moraines that lie between the Tioga and Tahoe moraines at Bloody Canyon, and correlated them to western Sierra Nevada Tenaya moraines corresponding with late Wisconsin continental glaciation. Additionally, they abandoned the use of the names Sherwin and McGee at Bloody Canyon in favor of Mono Basin. Their reasoning, based on relative dating techniques, was that the oldest moraines at this particular site were demonstrably younger than the Sherwin and McGee tills found elsewhere along the eastern slope of the Sierra Nevada. Sharp and Birman (1963), however, argued that the Mono Basin moraine significantly predated the early Wisconsin Tahoe moraine, which truncates it (Figs. 5 and 6). Their conclusion was based on observations of different weathering characteristics of boulders incorporated into the two moraines, the subdued and rounded nature of the Mono Basin moraine compared to the Tahoe moraine, and the cross-cutting relationship between the two sets of moraines.

The work of Burke and Birkeland (1979) represents the most exhaustive study of the weathering characteristics of the glacial features at Bloody Canyon to date. They applied relative dating techniques to surficial and subsurface materials in their investigations, but modified and added to the techniques used by earlier workers. Based on their past investigations in other areas, they only collected data that they felt could be readily quantified to show the best promise for age control (Burke and Birkeland, 1979). Their criteria for the surficial features included: (1) the ratio

Figure 6. Comparison of the differing map interpretations of the glacial sequences at Bloody Canyon. Sharp and Birman (1963) recognized four glacial advances: Ti (Tioga), Te (Tenaya), Ta (Tahoe), and MB (Mono Basin). Burke and Birkeland (1979) recognized only two, the Tioga and Tahoe. Gillespie (1982) recognized the Tioga, Tenaya, two Tahoe advances Tai and Tair, the Mono Basin, as well as two ancient pre-Mono Basin moraines pMBI and pMBII (after Gillespie, 1982).

of fresh to weathered boulders; (2) pitted-to-nonpitted ratio (pits are concave depressions formed by mineral disintegration); (3) pit depth on boulders; (4) maximum height of resistant mafic inclusions in surface boulders; (5) rind-to-no rind ratio; (6) the hammer-blow weathering ratio (unweathered boulders give off a ring when struck with a hammer, weathered boulders respond with a dull thud); (7) the surface boulder frequency; (8) the granitic boulder-to-nongranitic boulder ratio (nongranitic rock types are generally more resistant to weathering than granitic types and should proportionally increase with time); (9) split boulder-to-nonsplit boulder ratio of surficial boulders; and, (10) oxidized-to-partially oxidized-to-unoxidized ratio of surficial boulders.

In the subsurface, Burke and Burkeland's (1979) data gathering centered on the number and intensity of grusified granitic boulders, the soil properties, including horizonation, color, texture, consistence (wet and dry), structure, pH, presence or absence of clay films, and the presence or absence of carbonate. Additionally, they also examined the overall moraine morphology including the width and slope angles.

Burke and Birkeland's (1979) investigation of the moraines at Bloody Canyon led them to the conclusion that the four-fold glacial sequence proposed by many of the earlier workers should be abandoned. Their conclusions were that only two moraines, which they referred to as the Tioga and Tahoe, were present at Bloody Canyon (Fig. 5 and 6). Their relative dating data did not indicate enough of a difference between moraines previously mapped as Tenaya and

Tioga to warrant two separate map units or events. The same held for moraines previously mapped as Tahoe and Mono Basin (Fig. 6). Their explanation for the topographic differences between the units previously mapped as Tahoe and Mono Basin was based on two arguments. The first was, ". . . That moraine breaching could be accomplished while ice occupies the valley, thus allowing ice-marginal streams to overtop and cut through lateral moraines, after the ice snout retreated above the Tahoe breach, readvance could be channeled to the northeast" (Burke and Birkeland, 1979, pp. 40-41). The second argument was supplied by Curry (1968) and Clark (1972), who proposed that vertical fault motion changed the configuration of the valley and, in turn, the path of the ice advance.

Numerical Ages Assigned to the Glacial Sequences at Bloody Canyon Based on Relative Dating Techniques

Age assignments for the Tioga and Tahoe moraines at Bloody Canyon by the above mentioned workers were hampered by the fact that the till composing the moraines did not contain any materials that could be dated directly with the methods available at the time. Numerical ages from the Burke and Birkeland study were in large part based on the findings of others working on the eastern slope of the Sierra Nevada, and then applied to Bloody Canyon via inter-valley correlation. For example, Dalrymple (1964a) obtained K-Ar dates from basalt flows between what he interpreted as Tahoe and pre-Tahoe moraines at Sawmill Canyon (~125 kilometers south of Bloody Canyon). He obtained ages of $90,000 \pm 90,000$ y BP and $60,000 \pm 50,000$ y BP, which were thought to provide a maximum limiting age for the Tahoe

Glaciation. Recalculated ages of the same samples are $93,000 \pm 116,000$ y BP and $58,000 \pm 73,000$ y BP; the latter ages and additional ages, ranging from $296,000 \pm 116,000$ to $30,000 \pm 30,000$ y BP, were assigned a weighted mean age of $53,000 \pm 44,000$ y BP (one sigma error; Dalrymple and others, 1982). However, the site was re-examined and it was concluded that the underlying till was Tahoe and the overlying till was Tioga, thus providing a maximum age limit for the Tioga till and a minimum age limit for the Tahoe till (Burke and Birkeland, 1979; Dalrymple and others, 1982).

A limiting minimum age for the Tioga event was supplied by Adam (1967) from his work at Osgood Swamp, near the southern end of Lake Tahoe. He obtained a radiocarbon date of $9,990 \pm 800$ y BP from a tree stump removed from a small lake dammed by a Tioga terminal moraine. The above-mentioned limiting age dates were applied to the moraines at Bloody Canyon by Burke and Birkeland (1979) via inter-valley correlations employing the previously described relative dating techniques (Fig. 5).

Direct Dating Methods Employed at Bloody Canyon and Vicinity

The first attempt at obtaining direct calibrated numerical ages for the glacial events at Bloody Canyon without having to rely on inter-valley correlations was conducted by Gillespie (1982). He applied a method developed by Crook and Kamb (1980) that consists of measuring the speed of acoustical waves through surficial layers of exposed boulders on the crest of the moraines. The wave speed is progressively reduced from ~ 4 km/s to ~ 0.3 km/s in progressively more weathered boulders (Gillespie,

1982). The recorded wave speed is then compared to a calibration curve established by Crook and Kamb (1980) from their work on alluvial clasts in the San Gabriel Valley to obtain a numerical age (Crook and Kamb, 1980). The idea on which the method hinges, for this application, is that if the extent of weathering is a monotonic function of time, the speed of the waves should provide a valid basis for age comparisons, providing that the boulders that are analyzed are truly representative.

Gillespie (1982) also conducted an extensive mapping exercise as part of his investigation and proposed a return to the four-fold division of the moraines similar to that of Sharp and Birman (1963), Birman (1964), and Sharp (1969) (that is, Tioga, Tenaya, Tahoe, and Mono Basin). Gillespie (1982), however, proposed that the Tahoe moraine was a composite of two distinctly different-aged moraines, and he proposed that the right lateral Mono Basin moraine had overridden and partially obscured at least two older moraines (Fig. 6). The ages of the various moraines that Gillespie's (1982) investigation determined are as follows: the Tioga was deposited ~18,000 y BP; the Tenaya moraine was deposited ~43,000 y BP; the Tahoe II moraine was deposited ~65,000 y BP; the Tahoe I was deposited ~85,000 to ~110,000 y BP; and that the Mono Basin moraines may be as young as ~85,000 y BP or as old as ~400,000 y BP (Fig. 5). No age estimation was made for the two pre Mono Basin moraines.

Dorn and others (1987) made the first attempt at obtaining direct numerical ages for the glacial events within the general area of study. They did ^{14}C analyses of organic material in rock varnish deposited directly on Tioga

till using tandem accelerator mass spectrometry, and cation-ratio dating of rock varnish deposited directly on Tahoe and Mono Basin tills using particle-induced X-ray emission. Their study site was the Pine Creek drainage (~80 kilometers south of Bloody Canyon). Rock varnish was collected from boulders exposed on the moraines. All boulders sampled were situated along moraine crests and samples were removed only from boulders that appeared not to have undergone any post depositional erosion. They attempted to avoid areas which could result in spurious ages: areas where runoff collects, near organic detritus, near active lichen or fungi colonies or where colonies appear to have lived in the past, or micro-environments that were too acidic or alkaline. The samples were run through several laboratory procedures to obtain concentrated samples of "juvenile" varnish. The depositional ages obtained by Dorn and others (1987) are: $13,910 \pm 200$ y BP minimum and $19,050 \pm 420$ y BP maximum for the Tioga; $143,000 \pm 27,000$ y BP minimum and $153,000 \pm 51,000$ y BP maximum for the Tahoe, and $182,000 \pm 28,000$ y BP minimum and $187,000 \pm 42,000$ y BP maximum for the Mono Basin (Fig. 5). No one has yet attempted to correlate these dates to other glaciated valleys on the east slope.

Another attempt at obtaining direct dates for the glacial events on the eastern Sierra Nevada was made by Phillips and others (1990). They attempted to measure the accumulation of cosmogenic chlorine-36 in boulders exposed on the moraines at Bloody Canyon. The idea behind this procedure is that as boulders are exposed at the surface, ^{36}Cl begins to accumulate due to exposure to cosmic-ray activation. The mechanisms for the accumulation are thermal

neutron activation of ^{35}Cl by cosmic-ray bombardment, spallation reactions of ^{39}K and ^{40}Ca , and muon capture by ^{40}Ca . This study measured $^{36}\text{Cl}/^{35}\text{Cl}$ ratios by accelerator mass spectrometry. Phillips and others (1990) evidently did not conduct a mapping program of the area, but instead relied on Gillespie's (1982) interpretation. Phillips and others (1990) obtained dates of 21,000 y BP (mean) and 23,000 y BP (maximum) for the Tioga; 24,000 y BP (mean) and 25,500 y BP (maximum) for the Tenaya; 59,800 y BP (mean) and 65,800 y BP (maximum) for the younger Tahoe; 207,000 y BP (mean) and 218,000 y BP (maximum) for the older Tahoe, and 103,000 y BP (mean) and 119,000 y BP (maximum) for the Mono Basin (Fig. 5).

Discussion Of Previous Works

The variety of approaches used by workers studying the glacial sequence at Bloody Canyon is well characterized by Burke and Birkeland's (1979) astute observation that there are those who will classify marginally differing moraines together, or "lumpers"; and those who place each moraine into a distinct glaciation, or "splitters."

Many of the dating schemes applied to the moraines on the eastern slope of the Sierra Nevada by previous workers display a resourceful approach at unraveling the glacial chronology. However, many contain uncertainties or problems that are difficult, if not impossible, to quantify.

Two major problems exist in the numerical dating of moraines. The first stems from the fact that moraines are almost always composed of material (till) much older than the glacial event in which it was deposited. Dating of this

material will yield ages that are considerably older than the glacial event, and essentially irrelevant to its true age. If material does exist that can yield relevant numerical ages, it usually underlies or overlies the till and can only offer maximum or minimum age estimates. This is illustrated by the basalt flows at Sawmill Canyon in Inyo County. Additionally, the Sawmill Canyon example contains further problems: 1) the flows are of an age that is difficult to determine by the K-Ar method. For rocks this young, only a small amount of radiogenic argon has accumulated, resulting in errors that are often greater than the calculated age; and 2) these dates must then be correlated to other areas using relative dating techniques. Burke and Birkeland (1979) cite many potential pitfalls in the application of relative dating in inter-valley correlations. Subtle variations in vegetation, climate, geographic orientation, or lithologies from valley to valley all could impart errors, the degree of which is hard to assess. Additionally, because relative dating methods are in large part based on subjective decisions made by the individual worker, data collection has poor potential for reproducibility among different investigators.

The second major problem with all the dating methods previously discussed is the uncertainties regarding the past history of the moraine surface. Many factors could potentially come into play. For example, all of the previously described methods, to varying extent, rely on data collected from exposed boulders on moraine crests, assuming that these boulders have been continuously exposed since deposition. A forest fire sweeping through the area

in the past could have "freshened" them by spalling off the surfical layer, which would in effect reset the dating clocks. Moreover, boulders could have been weathered prior to transport and deposition, which would yield erroneously older ages.

The argument of whether it is better to "lump" the moraines together and perhaps present an over-simplified view, or to "split" the moraines and run the risk of possibly over-complicating the glacial history will only be resolved with the establishment of an accurate chronology.

TEPHROCHRONOLOGY

This method of dating and correlation depends on the fact that a mantle of volcanic ash (tephra), deposited over a wide region in a brief moment of geological time and later buried, forms an ideal chronostratigraphic marker. One of the pioneers in the use of tephra as a dating method, the Icelandic geologist Sigurdur Thorarinsson, explained tephrochronology as ". . . A chronology based on measurement, connection and dating of tephra layers. In particular, tephrochronology is concerned with the establishment of a chronosequence of geologic events based on the unique characteristics of tephra layers" (1974 in Westgate and Gold p.xviii). One of the major advantages of tephra layers is that they represent essentially instantaneous time datums, and as such can serve as precise time-stratigraphic markers. The chemical composition of volcanic glass shards from individual eruptive sources can provide a unique chemical *fingerprint* for a tephra layer, and often can be traced to its source (Sarna-Wojcicki and others, 1991).

In recent years a large data base of analyzed and dated tephra layers has accumulated from work on or near the Pacific borderland of the United States. This library of information has proved invaluable in solving a variety of Quaternary geologic problems (for example, see Wilcox, 1965; Westgate and others, 1970; Randle and others, 1971; Sarna-Wojcicki, 1971, 1976; Mehringer and others, 1977, 1984; Blinman and others, 1979; Izett, 1981; Sarna-Wojcicki and others, 1979, 1984, 1987, 1991).

Chemical analysis of tephra shards is commonly obtained by the use of electron-microprobe, wavelength-dispersive and energy-dispersive x-ray fluorescence, and instrumental neutron-activation analyses, as well as some other techniques. All data in this study were obtained using a electron-microprobe analysis (EMA); for a discussion on the application of other chemical and petrographic methods, see Sarna-Wojcicki and others, 1991. EMA of tephra shards is a fairly rapid, easy to use technique. Generally, there is no need for elaborate sample preparation, because small areas of the sample can be analyzed. Additionally, EMA is a good technique to determine shard-to-shard chemical variations in tephra layers. However, there are disadvantages to the EMA. Only major and a few minor elements can be determined with enough precision for chemical characterization. Major elements which are commonly analyzed are Si, Al, Fe, Ca, K, and Na. The minor elements can include Mg, Mn, Ti, Cl, Ba, and P. Generally only about six or eight of these elements are present in sufficient quantities in any particular tephra shard to be useful in distinguishing one glass shard from another (personal communication C. Meyer, 1991; Sarna-Wojcicki and others, 1991).

Additionally, EMA of tephra shards can be complicated by the presence of water, carbon dioxide, or other volatiles that cannot be detected with most electron-microprobes. The presence of these volatiles leads to oxide and anion totals that usually total less than 100 percent. Generally, tephra erupted between historic time and about 4,000 y BP have totals ranging from 97 to 99 percent; older tephra shards will commonly display lower totals, ranging from 85 to 97

percent (Sarna-Wojcicki and others, 1991). The discrepancy in the totals occurs because tephra shards hydrate with time upon exposure to water or water vapor. However, lower totals can be normalized to 100 percent, on a fluid-free basis, reducing compositional scatter resulting from differences in the degree of hydration of a single tephra layer at different localities (Sarna-Wojcicki and others, 1991).

Analysis by EMA provides only a chemical analysis of the volcanic glass, and not an actual age of a tephra layer. Actual dating of tephra shards is done employing a variety of direct and indirect methods. Direct dating methods include K-Ar, $^{40}\text{Ar}/^{39}\text{Ar}$, fission-track dating of zircon and glass shards, hydration, thermoluminescence, and magnetostratigraphy (Sarna-Wojcicki and others, 1991). Indirect methods include radiocarbon, electron-spin resonance, amino-acid racemization, dendrochronology, biostratigraphy, sedimentation-rate curves, and written and oral history (for example, see Andrews and Miller, 1980; Sarna-Wojcicki and others, 1991).

Once a chemical analysis has been obtained by any of the previously described techniques, a comparison to other analyzed and dated tephra shards or layers is made using some statistical or mathematical measure of similarity. This study employed the similarity coefficient (SIMANAL) (Sarna-Wojcicki, 1976; Sarna-Wojcicki and others, 1979; 1984). This coefficient varies between 0 and 1, the latter representing a perfect match. Similarity coefficients for replicate EMA of samples from a single tephra layer typically range between 0.95 and 0.99, but will vary,

depending on the initial chemical homogeneity of a tephra layer, the eruptive source, the elements used in the comparison, and the post-depositional history of the tephra layer. SIMANAL is calculated as follows:

$$d_{(A,B)} = \frac{\sum_{i=1}^n R_i}{n},$$

where

$d_{(A,B)} = d_{(B,A)}$ = similarity coefficient for comparison between sample A and sample B,
 i = element number,
 n = number of elements,
 R_i = X_{iA}/X_{iB} if $X_{iB} \geq X_{iA}$; otherwise X_{iB}/X_{iA} ,
 X_{iA} = concentration of element i in sample A, and
 X_{iB} = concentration of element i in sample B.

METHODS OF THIS INVESTIGATION

Although detailed mapping was not a part of this investigation, a preliminary map was constructed from pertinent aerial photos and then field checked. This study concurs with the mapping of Sharp and Birman (1963), Birman (1964), and Sharp (1969) (Fig. 6). No evidence for Gillespie's (1982) proposal that the right lateral Tahoe moraine at Bloody Canyon is a composite of two differing age moraines was observed in the field.

Sampling

Pits were dug in the till of the Tahoe moraine, in order to obtain samples for examination, separation and analysis (Fig. 7). Pit locations were on, or very near, the crest of the right lateral Tahoe moraine at Bloody Canyon (Fig. 8). This area is covered by vegetation belonging to the Great Basin sage community (Storer and Usinger, 1963). The pits were dug on the moranial crest in order to mitigate any effects of inflation, deflation, or other variations in the weathering history of the soil profile. Additionally, areas that appeared to have been disturbed in the past by burrowing animals or human activity were avoided. All pits were excavated using hand tools. Four pits were dug ranging in depth from approximately 1 m (3 feet) to approximately 2.5 m (8 feet). No evidence of soil mixing, such as active burrows, crotovinas, old beer cans etc., was noted in any of the soil pits. After each pit was excavated, one wall was stripped of approximately 7 centimeters of material,

Figure 7. Right lateral Tahoe moraine, Bloody Canyon, pit 1, K.R. "Pitbull" Nehring digging in.

Figure 8. Soil pit location map: Pit 1 (samples SS-91-1-Su through SS-91-1-8); pit 2 (samples SS-91-2-Su through SS-91-2-3); pit 3 (samples SS-91-3-Su through SS-91-3-3); pit 4 (samples SS-91-4-Su through SS-91-4-5). Symbols as in figure six: Ti (Tioga), Te (Tenaya), Ta (Tahoe), and MB (Mono Basin). Base map from Sharp and Birman (1963).

working from top to bottom. Samples were then removed from the cleaned wall working from bottom to top to prevent any soil mixing or contamination. Approximately one kilogram of material per sample was collected, transported, and stored in plastic bags. The samples were collected on approximate thirty-centimeter centers, removing material from about 15 centimeters above and below the center to obtain a continuous sample of the exposed material, from the surface to the base of the pit. A string of characters identifies the samples, e.g. SS-91-1-2, is interpreted as follows: SS is the author's initials, 91 is the year the sample was collected, 1 refers to the soil pit (a total of four soil pits were dug), and the last number refers to the sample depth as measured in feet from the surface (Su).

Sample Preparation

Samples were processed and analyzed at the Tephrochronology Laboratory of the U.S. Geological Survey, in Menlo Park, California. Optic immersion oil and a petrographic microscope were used to examine the raw samples in order to determine if they contained volcanic glass shards. All samples did contain glass shards, ranging from less than one percent of the total sample in some of the deeper samples to over ninety percent in some of the surface samples. After each laboratory procedure the sample was again examined with a petrographic microscope to determine the next procedure to be performed. The samples were wet sieved using 100 and 200 mesh nylon screens and plastic holders to avoid potential contamination with metals. Only the -100 +200 mesh (-80 +150 μ m) fraction was

further processed. Tephra in many of the samples displayed slight to moderate amounts of brownish iron staining as well as varying degrees of devitrification. The samples were then treated with a 10 percent solution of HCL for sixty to ninety seconds and an 8 percent solution of HF for ten to twenty five seconds to remove the iron staining and devitrified rind. All acid treatments were done in an ultrasonic cleaning unit. A hand held magnet was then used to remove the highly magnetic material. The samples were then passed through a Frantz magnetic separator to remove as much of the magnetic material as possible. To further separate the tephra from the matrix material, heavy and light liquids (methylene iodide and acetone) were employed until a sample of ninety-eight percent or greater of volcanic glass was obtained. The processed sample was then placed in a plastic slide with epoxy, ground and polished with diamond paste, carbon coated in a vacuum evaporator, and mounted in the EMP.

Sample Analysis

All sample analyses was done with an ARL nine-channel SEMQ electron-probe microanalyser. A specimen current of 0.01×10^{-6} amperes with a 15 Kv potential on the beam was used with a count time of 20 seconds per sample. Additionally, the beam diameter was defocused to approximately 25 μ m in order to minimize migration of sodium from the focal zone. The instrument was calibrated for the major elements using a synthetic andesitic glass manufactured by Corning Glass, and for the minor elements using synthetic Mn_2O_3 and TiO_2 glasses manufactured by the

USGS. All data were corrected with a Bence-Albee correction scheme (personal communication C. Meyer, 1991). Nine major and minor oxides were analyzed: SiO_2 , Al_2O_3 , Fe_2O_3 , MgO , MnO , CaO , TiO_2 , Na_2O , and K_2O .

Fifty analyses were done for each sample interval, with the exception of the sample from the 2.5 meter interval (SS-91-1-8), for which one hundred analysis were obtained. This study obtained chemical information on over 1200 shards. The EMP data were then edited for errors (for example, grains that were not glass but other minerals, such as feldspars or quartz, were deleted from the data files). Plots of CaO vs FeO were generated using the MinitabTM statistical program. The plots ranged from a random "shotgun" pattern in which no discrete groupings were apparent, to plots with one or more discrete clusters or groupings which were interpreted to represent unique families of tephra, or individual tephra layers (Fig. 9, a and b). The groupings were hand contoured, the chemical parameters (oxide totals) of the groups defined and an average composition for the group was calculated using the MinitabTM statistical program. Average compositions for selected groups were then recalculated on a fluid free basis, and input into the USGS database for correlation with previously analyzed tephra layers, many of which are dated (Appendix A). Additionally, individual shards which displayed high concentrations of CaO (uncorrected oxide weight percentage greater than approximately 0.65%) (Appendix B), and low concentrations of FeO (uncorrected weight percentage less than approximately 0.84%) (Appendix C) were also input separately into the database for

Plot CaO vs FeO for sample SS-91-2-2

Figure 9a. Plot of CaO vs. FeO for sample SS-91-2-2. This is referred to as a "shotgun" pattern in the text, no discrete groupings are apparent. The number "2" indicates that two shards occupy the same field.

Plot CaO vs FeO for sample SS-91-2-1

Figure 9b. Plot of CaO vs. FeO for sample SS-91-2-1. The author recognizes four discrete groupings of tephra shards (circled). The number "2" indicates that two shards occupy the same field.

RESULTS

Many of the samples from this study correlated with analyzed and dated tephra layers in the USGS database, some of which have poor or no age control. Only matches to tephra layers with good age control are presented. Additionally, only shards with a high probability of correlation are included (that is with a similarity coefficient (S.C.) greater than 0.97 and no major deviations in the oxide percentages). The correlative tephra layers occur at a variety of areas in the vicinity of Bloody Canyon, including Barrett Lake, Crooked Meadow, and Walker Lake (Sarna-Wojcicki and others, 1988); areas in and around Mono Lake (Wilson Creek, South Shore Cliffs, Mono Craters, and Panum Crater), Rush Creek, and Tuolumne Meadow (Lajoie, 1968; K.R. Lajoie, unpublished data, 1988); the Carson Sink (Lajoie, 1968; Davis, 1978; K.R. Lajoie, unpublished data, 1988); near Bishop (Sarna-Wojcicki and Pringle, 1992); Swamp Lake (S. Smith, unpublished data, 1990); Fish Lake Valley, Lake Tecopa, and the Ventura Basin (personal communication A. Sarna-Wojcicki, 1993) (Fig. 10). No discrete layers of tephra were encountered in the soil pits; shards occurred only as disseminated particles in the soil or till matrix. The abundance of tephra shards displayed a monotonic decrease from as high as 90 percent in some of the surface samples to much less than one percent in the deeper samples.

Figure 10. Location map for correlative tephra layers to this study as discussed in text.

The correlative ages of the tephra shards recovered from the Tahoe moraine were divisible into four time spans: Holocene, latest-late Pleistocene (~12,000 to ~36,000 y BP), late Pleistocene (~65,000 to ~90,000 y BP), and middle Pleistocene (~758,000 to ~1,200,000 y BP), and will be presented in that order. The reader is referred to Figure 11 for a summary of the preceding and following discussions.

Holocene (<10,000 y BP) Shards

Tephra shards that correlate with early through late Holocene tephra layers were noted in all four of the soil pits, and these shards were dispersed throughout all depth intervals, with the exception that no shards from the 0.6 m (two foot) interval of pit number two (SS-91-2-2) displayed a convincing correlation to Holocene tephra layers (Fig. 11). All of the correlative Holocene shards originate from the Mono Craters eruptive center, approximately 9 km east of the Bloody Canyon study site (Fig. 4). In some instances tephra shards from the deeper sample intervals correlate with tephra layers as young as 700-800 y BP (Appendix A sample SS-91-1-8D. All of the correlative Holocene tephra layers and location information can be found in Appendix A).

Latest-Late Pleistocene (~12,000 to ~36,000 y BP) Shards

Tephra shards recovered from the Tahoe moraine at Bloody Canyon correlate to many tephra layers erupted from the Mono Craters during this time span; these layers were deposited throughout the study area. Shards correlating to

Figure 11 (following page). Summary of the results of this study. The left column of each soil pit displays the relative proportions of the various ages of the suites of tephra shards recovered from the Tahoe till at Bloody Canyon. Notice: 1) the suites of older tephra shards are generally located deeper in the profile; 2) the occurrence of Holocene-aged tephra shards throughout the profile; and, 3) the sporadic occurrence of Bishop Ash. The column on the right of each soil pit represents the percentage of tephra shards vs. soil matrix. Notice that in all four pits the percentage of shards decreases with depth and appears to asymptotically approach zero percent. The conclusion from this information is that the various volcanic source areas local to the Bloody Canyon study site deposited volcanic glass directly onto the pre-existing Tahoe moraine. This material was then translocated to depth. The occurrence of the Holocene tephra shards throughout the entire depth profile is attributed to the close proximity to the Mono Craters source area. The sporadic distribution of the Bishop Ash is attributed to deposition onto the Tahoe moraine by wind from the shards' *original* site of deposition.

Figure 11 (explanation on preceding page).

tephra layers of this time span were present in pits one, two, and four. None were noted in pit three. Additionally, latest to late Pleistocene shards were not noted in any of the surface samples. Their occurrence appears to be concentrated in the intermediate depth intervals (Fig. 11). All of the correlative latest-late Pleistocene tephra layers and location information can be found in Appendix A and B.

Late Pleistocene (~65,000 to ~90,000 y BP) Shards

Correlative tephra layers for shards of this age were erupted from Mammoth Mountain approximately 18 km southeast of the Bloody Canyon study site (Fig. 4). These layers are found in the sediments of Walker Lake, Nevada at depths of 65-80 m. At Walker Lake these layers are constrained by uranium-series ages between ~65,000 to ~90,000 y BP (Sarna-Wojcicki and others., 1988a) (Fig. 12). Shards of this age range were only noted in soil pits one and four and were located in the deeper sample intervals (Fig. 11). Information on the shards which correlate to the Walker Lake tephra layers can be found in Appendix B.

Middle Pleistocene (~758,000 to ~1,200,000 y BP) Shards

Five shards were noted in this study that correlate to the Bishop ash which is dated at $758,000 \pm 2,000$ y BP (Sarna-Wojcicki and Pringle, 1992), or the Bailey ash which is dated at $1,200,000 \pm 40,000$ y BP (these shards shall be referred to as Bishop or Bishop type). These shards were noted in pit one at depths of 1.8 m and 2.4 m (two shards) and in pit four in the surface sample and at 0.6 m

Figure 12. Age vs. depth curve for tephra layers from Walker Lake, NV, as discussed in text (revised Sarna-Wojcicki and others, 1988a).

(Fig.11). The eruptive source for the Bishop type shards is the Long Valley Caldera ~25 km southeast of the Bloody Canyon study site. This explosive event involved an estimated 500 cubic kilometers of material deposited over an area exceeding 1 million square kilometers (Bailey and others, 1976; Izett and others, 1988). The presence of these shards in the Tahoe till undoubtedly represents eolian influx from the tephra shards' *original* depositional site. Information for the shards which correlate with Bishop shards can be found in Appendix C.

DISCUSSION AND CONCLUSIONS

The driving idea for this investigation was to correlate tephra shards found in the fine fraction of the till matrix and/or soil of the Tahoe moraine with previously analyzed and dated tephra layers local to the Bloody Canyon study site. Ideally, the youngest population of tephra shards in the till matrix and the oldest population in the soil zone would constrain the age of the Tahoe glacial event. The close proximity of the study site to the Mono Craters, Inyo Craters, and Mammoth Mountain eruptive sources and their respective eruptive histories, which are well documented from dated tephra layers found throughout the general area, would ensure large populations of datable volcanic glass shards. Blankets of tephra deposited on the ice occupying the valley, or, into the glacier's "watershed" would become incorporated into the till by the glacier's stadial fluctuations, or infiltration. After cessation of Tahoe glaciation, blankets of tephra from the above mentioned sources would become incorporated into the soil profile by infiltration or the activity of animals.

Alternatively, if the technique for age constraint proved inconclusive, a large population of the oldest, most accurately dateable tephra shards in the till matrix could demonstrate glacial activity at that particular instant in time. Information from the alternative hypothesis could then be used to support or refute earlier age assignments to Tahoe glacial activity at Bloody Canyon. One potential problem with this investigation is the possibility of glass shards older than the depositional (glacial) event being

incorporated into the till, thus providing a suspect or erroneous maximum age. This could occur in several ways, such as: 1) transportation of the shards from their *original* site(s) of deposition to the pre-existing Tahoe moraine with subsequent translocation into the till matrix; 2) incorporation of shards from the older tills at the study site into the Tahoe till by the glacier's advance and/or stadial fluctuations; or, 3) eolian transportation of shards from their original site(s) of deposition onto the active Tahoe glacier with subsequent incorporation into the till matrix by the glaciers' stadial fluctuations. The presence of the Bishop and Bishop-like shards in one of the surface samples and at sporadic depth intervals argues in favor of number one. The absence of shards older than the Bishop and Bishop like shards argues against two and three. Furthermore, no evidence of dissolution of older volcanic glass was noted which would explain the absence of older tephra shards. Evidence for the dissolution of older volcanic glass shards would appear as a silica grain coating in the interstices of aggregates of grains, or as a silica pan. It should be noted that it is possible that older glass shards could have been translocated to greater depths than were sampled for this study.

The stratigraphic arrangement of the various suites of tephra shards displayed in Figure 10 indicates deposition of discrete populations of volcanic glass shards onto the surface of the pre-existing moraine with subsequent translocation to depth. As the figure shows, the age of the groups of tephra shards generally increases with depth. This strongly suggests that several of the documented

explosive volcanic events which have occurred in the region deposited volcanic glass directly onto the surface of the (pre-existing) Tahoe moraine. Much of this material would be retained in the uneven surface topography of the moraine, and the finer fractions of the glass shards would be translocated down into the soil profile. However, any contention that the groups of shards provide either a constraining or penecomtemporaneous age for Tahoe glacial activity is challenged by the presence of numerous glass shards at the same depth which are significantly younger than the Pleistocene shards. For example the shards found at 2.5 m (Appendix A: SS-91-1-8D) correlate to tephra layers dated at 700-800 y BP. The occurrence of the younger Holocene shards at the same depth intervals as the Pleistocene shards gives rise to the possibility that the older shards could have been transported by wind to the surface of the moraine from their original site(s) of deposition and then translocated to depth. At present this would not seem plausible for the following reasons: 1) only one Pleistocene shard was noted in any of the surface samples; and, 2) no shards older than the five identified Bishop Ash shards were noted in any sample interval of the four soil pits. If post depositional transportation to the study site and subsequent translocation to depth was the case, it seems highly unlikely that one, or more likely both, of the above arguments would occur.

This investigation views the presence of the Holocene shards at the same depth as the Pleistocene shards to be the result of: 1) the nearby source of the Holocene shards (Mono Craters) which led to the deposition of large volumes of

volcanic glass on the moraines; 2) The permeable nature of the soil on the moraine, and 3) The older groups of Pleistocene shards having essentially stalled at their present depth, that is, at the maximum depth of the effective translocation mechanism(s).

In the pursuit of the original hypothesis several unexpected and interesting results were obtained. For example, all of the soil pits except Pit Three contained numerous Pleistocene tephra shards (Fig. 10). The reason for their absence in one pit is not clear; all four pits are located along the crest of the moraine a relatively short distance from one another (Fig. 5), and presumably experienced very similar micro-environments and deposition patterns. Moreover, late Holocene shards were present throughout the depth profile of all of the soil pits, which was unexpected and surprising. The young age of some of the identified tephra shards in the deeper sample intervals documents unusually rapid translocation rates and suggests that large volumes of Holocene tephra were deposited on the surface of the moraine, available for translocation into the soil profile. The fine fraction of some of the surface samples being composed of over 90% glass shards tends to support this contention. It seems improbable that tephra shards deposited on the surface of the moraine only 700 to 800 y BP could be translocated by infiltration alone to a depth of 2.5 m (personal communication J. Yount and R. Burke, 1992), particularly in light of the region's arid environment during this time period (Birkeland, 1969; Curry, 1969).

Although no soil pits were dug in areas displaying

signs of surficial disturbance, sample collection was done with care to avoid mixing, and no indications of disturbance were noted in the subsurface (active burrows, crotovinas, etc.). It seems that a component of mechanical mixing should also be present to explain this rapid rate of translocation. However, the fairly linear decrease in the relative abundance of tephra shards with depth (Fig. 10) would seem to argue against mechanical mixing. If a component of mechanical mixing was the case, a stepwise decrease (or increase) in the ratio of tephra shards to soil with depth would be expected.

As is often the case when an attempt is made to answer a particular question, new questions arise. For example: 1) What mechanism(s) are responsible for the rapid rate of translocation? One method to answer this question would be to measure the decrease in the ratio of $^{36}\text{Cl}/^{35}\text{Cl}$ with depth. If translocation of tephra shards is purely the result of infiltration, the decrease in the accumulation rate should be linear; mechanical translocation should produce a stepwise decrease in the accumulation rate (personal communication Alan Gillespie, 1992). 2) To what depth will Holocene tephra shards be present? 3) Will tephra shards older than the 65,000 to 90,000 y BP correlative Walker Lake shards be encountered at greater depths? 4) If mechanical mixing is a component of the translocation of the Holocene tephra shards, to what depth does it have an influence (shards are present to at least 2.5 m in this study)? 5) What flora and/or fauna are responsible for the translocation of the Holocene shards? Many of these questions would be difficult to pursue at Bloody Canyon if

the investigator has to rely on hand-dug pits. A more appropriate area for investigation might be the Tahoe moraines at Virginia Lakes about 20 km north of the Bloody Canyon study site, where deep road cuts provide good exposures of the till (personal communication A.M. Sarna-Wojcicki, 1992).

Because of the presence of discrete groups of volcanic glass shards in deeper portions of the soil developed on the Tahoe till at Bloody Canyon, which display a strong correlation to tephra layers in Walker Lake dated at 65,000 to 90,000 y BP, it is the conclusion of this investigation that the tephra had to have been deposited on a pre-existing landform. Therefore, the soil formed on the Tahoe moraine and the underlying till is at least as old as the correlative tephra layers, and perhaps older. This implies that the Tahoe glacial event occurred contemporaneous with the Late Illionian continental glaciation, or earlier. Consequently, this places the Tahoe glacial event in deep-sea oxygen-isotope stage six (~125,000 to ~190,000 y BP) (or an older stage) and not in stage four as suggested by many of the earlier workers at Bloody Canyon (Fig. 4). In addition, infiltration and/or mechanical mixing by the indigenous flora and/or fauna are responsible for a surprisingly rapid rate of translocation of Holocene tephra shards to at least 2.5 m in the Tahoe moraine at the Bloody Canyon study site. An investigation into many of the questions raised by this study would be in order. An appropriate area for further investigations might be at Virginia Lakes.

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APPENDICES

The sample identification used for this study, for example SS-91-1-2, is interpreted as follows: SS refers to the authors initials, 91 is the year the sample was collected, 1 refers to the soil pit (a total of four soil pits were dug), and the last number refers to the sample depth as measured in feet from the surface (Su).

In appendix A the capital letter following the sample identification string refers to the particular grouping of tephra shards on the elemental plot(s) (for example SS-91-1-SuB). In appendices B and C the number inside the parentheses following the sample identification string refers to the particular raw EMA sample run.

Each averaged composition or individual shard was compared to the first fifty closest matches. The output, in most cases, has been edited so it can be viewed on one page. The upper "block" of information contains the actual oxide concentrations obtained from electron-microprobe analysis (left hand column), and the recalculated values (right hand column). The lower "block" contains analysis of samples of the closest chemical matches of tephra layers in the USGS Menlo Park data base with the similarity coefficient (S.C.) in the far right-hand column. For some samples the probe output and recalculated values for a sample are on the first page, and closest matches from the USGS database are on the following page. Tephra layers that are dated or closely constrained in age, and that are considered to be correlative, have been underlined. Correlations are based on the similarity coefficient and similarity of all the

oxide percentages. Some samples from this study may display a close chemical similarity to tephra layers that rank high in the table and have not been underlined, in these cases the tephra layers ages are not well constrained, and for purposes of this investigation have been ignored.

APPENDIX A
PLOTS of FeO vs. CaO

The first page for each sample is the plot generated with the MinitabTM program. The boxed in area defines the chemical parameters (oxide totals) used to obtain an average composition for the grouping. This average composition was input into the USGS database for correlation to previously analyzed and dated tephra layers.

SS-91-1-SuB: Strong correlation with: 9) KRL91982F (S.C. 0.9867) a Holocene tephra layer from Mono Craters; 20) KRL-82182 (A1) (S.C. 0.9836) from a core of Crooked Meadow, dated at ~7,100 y BP; 24) WL 4-2 3.31m (S.C. 0.9826) from a core of Walker Lake, dated at ~2,750 y BP.

SS-91-1-1B: Strong correlation with: 9) KRL91882B (S.C. 0.9896) a Holocene tephra layer from Mono Craters; 14) KRL-82182 (A1) (S.C. 0.9886) (deviation in MgO) from a core of Crooked Meadow, dated at ~7,100 y BP; 28) BL-RSA-5 (S.C. 0.9859) (deviation in MgO) from a core of Barrett Lake, dated at ~900 to ~1,200 y BP; 29) KRL-91882A' (S.C. 0.9859) a Holocene tephra layer from Mono Craters; and, 30) KRL-82282A (S.C. 0.9858) (deviation in MgO) from Mono Craters, dated at ~1,200 y BP.

SS-91-1-2A: Correlates with: 6) 679-409-6 (S.C. 0.9878) (deviation in Mn) from Rush Creek, dated at $31,900 \pm 1,300$ y BP; 13) KRL-91982-K (S.C. 0.9819) (deviation in Mn) from the South Shore Cliffs of Mono Lake, dated at ~34,000 y BP; 15) KRL7982-17 (S.C. 0.9799) from Wilson Creek, dated at ~34,000 y BP; and, 23) WL-5-5 (36.93m) (S.C. 0.9775) from a core of

Walker Lake dated at ~34,000 y BP.

SS-91-1-2B: Strong correlation with: 23) OD-ML-65cm (S.C. 0.9828) from a core from Mono Lake, dated at $1,950 \pm 110$ y BP; 36) WL CORE G 380cm (S.C. 0.9816) from a core of Walker Lake dated at ~3,700 y BP; and, 39) WL-2-3-1.94m (S.C. 0.9814) also from a Walker Lake core dated at ~1,500 y BP. Additionally, this sample correlates to many KRL samples all local to the study site, and in the same age range as the Walker Lake tephra layers.

SS-91-1-3A: Strong correlation with: 6) WL-2-3-1.94mm (S.C. 0.9837) from a core of Walker Lake dated at ~1,500 y BP. Also, correlates with many other Walker Lake tephra layers of similar age including: 18) OD-ML-65cm (S.C. 0.9819) dated at $1,950 \pm 110$ y BP; and, 19) BL-RSA-4 (S.C. 0.9819) from Barrett Lake, dated at 900-1,200 y BP.

SS-91-1-4A: Correlates with: 3) KRL-82182(A-4) (S.C. 0.9849) from Crooked Meadow, dated at ~3,500 y BP; 23) BL-RSA-7 (S.C. 0.9761) (deviation in Fe and Ti) from a core of Barrett Lake, dated at ~3,400 y BP; and, 30) BL-RSA-9 (S.C. 0.9753) (deviation in Fe) from a core of Barrett Lake, dated at ~3,500 y BP.

SS-91-1-5A: Correlates with: 5) SL-262.5 (S.C. 0.9853) from a core of Swamp Lake, dated at ~4,000 y BP; 7) BL-RSA-6 (S.C. 0.9836) (slight deviation in Al) from a core of Barrett Lake, dated at ~3,200 y BP; and, 16) WL-8-7 (S.C. 0.9813) (slight deviation in Si and Al) from a core of Walker Lake, dated at ~4,500 y BP.

SS-91-1-6A: Good correlation with: 3) KRL-82982-M (S.C. 0.9873) (deviation in MgO) and 4) KRL-82982-J (S.C. 0.9868) both Holocene tephra layers from Mono Craters, and, 6) SL-

262.5 (S.C. 0.9854) from a core of Swamp Lake, dated at ~4,000 y BP.

SS-91-1-6B: Strong correlation with: 4) KRL-91882G (S.C. 0.9916) from Mono Craters, dated at ~1,200 y BP, as well as many other KRL's of similar age; 6) SL-115.5 (S.C. 0.9913) from a core of Swamp Lake, dated at ~1,960 y BP; 15) Walker Lake Core G 380cm (S.C. 0.9884) from Walker Lake, dated at ~3,700 y BP; and, 16) WL CORE G 370cm also from a core of Walker Lake, dated at ~3,600 y BP.

SS-91-1-7A: Strong correlation with: 4) SL-115.5 (S.C. 0.9929) from a core of Swamp Lake, dated at ~1,960 y BP; 5) OD-ML-65cm (S.C. 0.9923) from a Mono Lake core, dated at $1,950 \pm 110$ y BP; 6) BL-RSA-4 (S.C. 0.9919) from a core of Barrett Lake, dated at 900-1,200 y BP; and, 14) WL 2-2-2.64 (S.C. 0.9902) from a core of Walker Lake dated at ~1,200 y BP.

SS-91-1-7B: Strong correlation with: 8) KRL-82982-J (S.C. 0.9795) from a Holocene tephra layer at Mono Craters; and, many other KRL's of similar age. 10) SL-262.5 (S.C. 0.9723) from a core of Swamp Lake, dated at ~4,040 y BP; and, 12) BL-RSA-6 (S.C. 0.9760) from a core of Barrett Lake, dated at ~3,200 y BP.

SS-91-1-8B: Strong correlation with: 2) SL-262.5 (S.C. 0.9887) from a core of Swamp Lake, dated at ~4,040 y BP; 11) BL-RSA-6 (S.C. 0.9837) from a core of Barrett Lake, dated at ~3,200 y BP; 3) KRL-82982-J (S.C. 0.9884) and 8) KRL-82882-M (S.C. 0.9846) both from Holocene tephra layers at Mono Craters; and, 21) WL 8-7 62-64.5cm (S.C. 0.9805) from a core of Walker Lake, dated at ~1,000 y BP.

SS-91-1-8C: Although Mg displays deviations good

correlations with: 6) KRL91982D (S.C. 0.9926) and other Holocene tephra layer from Mono Craters. 9) Walker Lake Core G 380cm (S.C. 0.9920), dated at ~3,700 y BP; 11) SL-115.5 (S.C. 0.9917) from a core of Swamp Lake, dated at ~1,960 y BP; and, 16) SL-103 (S.C. 0.9907) from a core of Swamp Lake, dated at ~1,780 y BP.

SS-91-1-8D: Strong correlation with: 2) SL-103 (S.C. 0.9930) from a core of Swamp Lake, dated at ~1,780 y BP; 3) KRL-82182(A-1) (S.C. 0.9926) from Crooked Meadow, dated at ~7,200 y BP; and, 5) BL-RSA-2 (S.C. 0.9911) from a core of Barrett Lake, dated at 700-800 y BP. Sample also correlates with other Swamp Lake and KRL samples of similar age.

SS-91-2-SuA: Strong correlation with: 31) KRL-82182(A-4) (S.C. 0.9777) from Crooked Meadow, dated at ~3,500 y BP; and, 34) WL-2-3-1.94m (S.C. 0.9772) from a Walker Lake core dated at ~1,500 y BP. Other KRL and Walker Lake correlatives are of similar age.

SS-91-2-SuB: Strong correlation with: 31) KRL-82282A (S.C. 0.9787) from Panum Crater, dated at ~1,200 y BP.

SS-91-2-1A: Correlates with: 11) WL-2-3-2.14m (S.C. 0.9788) (Mg and Ti deviate) from a core of Walker Lake, dated at ~1,750 y BP; and, WL-2-3-1.94m (S.C. 0.9777) (Mg displays a slight deviation) also from Walker Lake, dated at ~1,500 y BP.

SS-91-2-1B: Correlates with: 22) KRL-92082D (S.C. 0.9757) (Ti displays a slight deviation from sample) from the Carson Sink, dated at ~28,000 y BP.

SS-91-2-1C: Strong correlation with: 22) KRL82282A (S.C. 0.9794) from Panum Crater, dated at ~1,200 y BP; 39) KRL-82182(A1) (S.C. 0.9760) from Crooked Meadow, dated at ~7,200

y BP; and 41) BL-RSA-5 (S.C. 0.9758) from a core of Barrett Lake, dated at 900-1,200 y BP.

SS-91-2-3A: Correlates with: 10) 679-409-6 (S.C. 0.9829) (deviation of TiO) from Rush Creek, dated at $31,900 \pm 1,300$ y BP; 11) KRL-91982-K (S.C. 0.9816) (deviation of Ti) from South Shore Cliffs of Mono Lake, dated at $\sim 34,000$ y BP; 18) KRL-92082-A (S.C. 0.9779) from the Carson Sink, dated at $\sim 28,000$ y BP; and, 21) Mono-15 (S.C. 0.9772) from Wilson Creek, dated at $\sim 26,200$ y BP.

SS-91-2-3B: Strong correlation with: 7) WL 8-7 (S.C. 0.9836) from a core of Walker Lake, dated at $\sim 4,300$ y BP; 15) BL-RSA-6 (S.C. 0.9807) from a core of Barrett Lake, dated at $\sim 3,200$ y BP; 19) KRL-82182(A-4) (S.C. 0.9792) from Crooked Meadow, dated at $\sim 3,500$ y BP; and, 21) SL-262.5 (S.C. 0.9779) from a core of Swamp Lake, dated at $\sim 4,040$ y BP.

SS-91-2-3C: Correlates with: 26) KRL82782A (S.C. 0.9825) (deviation in Ti) from Panum Crater, dated at $\sim 1,200$ y BP; and, 27) BL-RSA-5 (S.C. 0.9820) (deviation in Mg) from a core of Barrett Lake, dated at 900-1,200 y BP.

SS-91-3-SuA: Strong correlation with: 11) KRL-82182(A-4) (S.C. 0.9798) from Crooked Meadow, dated at $\sim 3,500$ y BP; 20) BL-RSA-7 (S.C. 0.9732) from a core of Barrett Lake, dated at $\sim 3,400$ y BP; and, 32) BL-RSA-9 (S.C. 0.9713) from a core of Barrett Lake, dated at $\sim 3,500$ y BP.

SS-91-3-SuB: Correlates with: 30) KRL82782A (S.C. 0.9789) (Mg displays a slight deviation) from Tuolumne Meadows, dated at $\sim 1,200$ y BP; and, 36) KRL82182 (S.C. 0.9781) from Crooked Meadow, dated at $\sim 7,200$ y BP.

SS-91-3-1B: Good correlation with: 11) KRL-82182(A-4) (S.C.

0.9806) from Crooked Meadow, dated at ~3,500 y BP; and, 18) BL-RSA-6 (S.C. 0.9784) from a core of Barrett Lake, dated at ~3,200 y BP.

SS-91-3-1C: Strong correlation with: 34) WL CORE G 370cm (S.C. 0.9745) from a core of Walker Lake, dated at ~3,500 y BP. Also correlates with other Walker Lake tephra layers of similar age; and, 42) BL-RSA-4 (S.C. 0.9737) from a core of Barrett Lake, dated at 900-1,200 y BP.

SS-91-3-2A: Strong correlation with: 5) KRL-82182(A-4) (S.C. 0.9866) from Crooked Meadow, dated at ~3,500 y BP; and 9) BL-RSA-6 (S.C. 0.9856) from a core of Barrett Lake, dated at ~3,200 y BP.

SS-91-3-2B: Good correlation with: 10) OD-ML-65cm (S.C. 0.9850) from a core of Walker Lake, dated at $1,950 \pm 110$ y BP; 19) WL-2-3-1.94m (S.C. 0.9829) from a core of Walker Lake, dated at ~1,500 y BP; and, 22) SL-115.5 (S.C. 0.9826) from a core of Swamp Lake, dated at ~1,960 y BP.

SS-91-3-2C: Strong correlation with: 25) KRL91882B (S.C. 0.9878) from a Holocene tephra layer at Mono Craters.

SS-91-3-2D: Correlates with: 13) WL 4-2 3.29m (S.C. 0.9888) from a core of Walker Lake dated at ~3,000 y BP; 20) KRL82182(A1) (S.C. 0.9866) from Crooked Meadow, dated at ~7,100 y BP; and, 24) BL-RSA-3 and BL-RSA-2 (S.C. 0.9863) both from cores of Barrett Lake and both dated at 800-1,200 y BP.

SS-91-3-3A: Good correlation with: 10) WL 4-2 3.2m from a core of Walker Lake, dated at ~3,000 y BP; 15) KRL82182 (A1) (S.C. 0.9908) from Crooked Meadow, dated at $7,270 \pm 70$ y BP; and, 23) KRL82282 (S.C. 0.9887) from a Holocene tephra layer

at Panum Crater.

SS-91-4-SuA: Good correlation with: 16) KRL-91882A' from a Holocene tephra layer at Mono Craters; 19) Walker Lake Core G 370cm (S.C. 0.9906), dated at ~3,500 y BP; and 21) KRL82182 (A1) (S.C. 0.9905) from Crooked Meadow, dated at ~7,100 y BP.

SS-91-4-1A: Good correlation with: 20) WL 4-2 3.29m (S.C. 0.9882) from a core of Walker Lake, dated at ~3,000 y BP.

SS-91-4-2B: Correlates with: 3) KRL-82182(A-4) (S.C. 0.9863) from Crooked Meadows, dated at ~3,500 y BP; 9) and, BL-RSA-7 (S.C. 0.9850) from a core Barrett Lake, dated at ~3,400 y BP.

SS-91-4-2C: Correlates with: 3) WL-2-3-1.94m (S.C. 0.9906), dated at ~1,550 y BP; 4) WL CORE G 380cm (S.C. 0.9903) dated at ~1,200 y BP; and; 5) WL-2-3-2.14m (S.C. 0.9896), dated at ~1,750 y BP. However, Mg displays a slight deviation in all three samples. All of the above tephra layers are from cores of Walker Lake.

SS-91-4-2D: Correlates with: 3) Walker Lake Core 180cm (S.C. 0.9871), dated at ~1,500 y BP. Also correlates with many other shallow Walker Lake tephra layers but the MnO displays a slight deviation.

SS-91-4-3A: Strong correlation: 3) KRL-82882-A (S.C. 0.9825) from Wilson Butte, dated at ~1,200 y BP. Also correlates with many other KRL's from the same general location and age.

SS-91-4-3B: Strong correlation with: 3) KRL-82882-H (S.C. 0.9909) from Mono Craters, dated at ~1,200 y BP; 7) BL-RSA-6 (S.C. 0.9886) from a core of Barrett Lake, dated at ~3,200 y BP; and, 16) SL-262.5 from Swamp Lake, dated at ~4,000 y BP.

SS-91-4-4A: Good correlation with: 2) KRL7982-4L (S.C. 0.9909) from Wilson Creek, dated at ~14,800 y BP; 4) KRL7982-14 (S.C. 0.9876) from Wilson Creek, dated at ~26,400 y BP; 7) KRL7982-8 (S.C. 0.9823) also from Wilson Creek, dated at ~25,300 y BP; and, 8) KRL7982-11L (S.C. 0.9812) from Wilson Creek, dated at ~26,150 y BP.

SS-91-4-4B: Good correlation with: 3) BL-RSA-6 (S.C. 0.9879) from a core of Barrett Lake, dated at ~3,200 y BP; 10) KRL-82182 (A-4) (S.C. 0.9832) from Crooked Meadow, dated at ~3,500 y BP; and, 13) KRL-82182 (A-3) (S.C. 0.9829) also from Crooked Meadow, dated at ~3,300 y BP. All of the above samples display slight deviation in Ti.

SS-91-4-4D: Correlates with: 2) KRL82282A (S.C. 0.9931) from Panum Crater, dated at 1,200 y BP; and, 8) KRL 82182(A1) (S.C. 0.9887) from Crooked Meadow, dated at ~7,200 y BP. However, Mn displays a slight deviation in both of the above samples.

SS-91-4-5A: Strong correlation with: 10) KRL 92082-A (S.C. 0.9831) from the Carson Sink, dated at ~28,000 y BP; 15) KRL 7982-17 (S.C. 0.9817) from Wilson Creek, dated at ~34,000 y BP; and, 22) WL-5-12 (61.28m) (S.C. 0.9794) from a core of Walker Lake, dated at ~73,000 y BP.

SS-91-4-5B: Strong correlation with: 18) KRL91982D (S.C. 0.9862) from a Holocene tephra layer at Mono Craters; 20) WL CORE G 380cm (S.C. 0.9858) from a core of Walker Lake, dated at ~3,700 y BP; and 23) BL-RSA-5 (S.C. 0.9855) from Barrett Lake, dated at 900-1,200 y BP.

SS-91-4-5C: Strong correlation with: 5) WL 4-2 3.29m (S.C. 0.9929) from a core from Walker Lake, dated at ~3,000 y BP;

15) BL-RSA-2 (S.C. 0.9901) from a core of Barrett Lake,
dated at 700-900 y BP; and, WL 4-2 3.31m (S.C. 0.9897) from
a core of Walker Lake, dated at ~3,100 y BP.

Plot calcium vs iron for sample SS-91-1-Su

Date of Analysis: 08/17/92

SAMPLE ID: SS-91-1-SuB

Recalculated to 100%

Raw Probe Data
Raw Prc 2 Data
(FeO to Fe2O3)

SiO2	74.109	SiO2	76.26
Al2O3	12.627	Al2O3	12.99
FeO	0.994	Fe2O3	1.14
MgO	0.037	MgO	0.04
MnO	0.046	MnO	0.05
CaO	0.520	CaO	0.54
TiO2	0.080	TiO2	0.08
Na2O	4.032	Na2O	4.15
K2O	4.622	K2O	4.76

TOTAL(R) 100.01

TOTAL(N) 97.180

TOTAL(O) 97.069

Listing of 50 closest matches for COMP. NO. 2962 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 08/21/92

C. No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total, R	Sim. Co
1	2962 SS-91-1-SuB	08/17/92	76.26	12.99	1.14	0.04	0.05	0.54	0.08	4.15	4.76	100.01	1.0000
2	2999 SS-91-3-2D	08/17/92	76.61	12.80	1.15	0.01	0.05	0.54	0.05	4.06	4.73	100.00	0.9907
3	2986 SS-91-3-3A	08/17/92	76.64	12.79	1.13	0.02	0.04	0.54	0.06	4.00	4.71	100.01	0.9906
4	2639 JB-B3-12 T241-3	10/21/91	76.51	12.05	1.11	0.03	0.00	0.54	0.05	4.16	4.67	100.00	0.9077
5	3001 SS-91-4-1A	08/17/92	76.70	12.72	1.12	0.02	0.04	0.54	0.05	4.08	4.75	100.02	0.9895
6	2991 SS-91-4-5C	08/17/92	76.73	12.76	1.14	0.03	0.03	0.54	0.05	4.02	4.70	100.00	0.9887
7	2638 JB-B3-11 T241-2	10/21/91	76.55	12.80	1.10	0.02	0.08	0.54	0.06	4.16	4.68	99.99	0.9877
8	2985 SS-91-3-2C	08/17/92	76.58	12.87	1.10	0.01	0.05	0.54	0.06	4.07	4.73	100.01	0.9877
9	2571 FLV-64-CS T56-5	07/01/83	76.61	12.89	1.14	0.03	0.05	0.55	0.05	4.12	4.56	100.00	0.9867
10	2974 SS-91-4-SuA	08/17/92	76.60	12.86	1.10	0.02	0.05	0.54	0.06	4.04	4.74	100.01	0.9866
11	431 YOS-1, T13-1	6/24/92	76.61	12.93	1.12	0.03	0.05	0.54	0.07	4.03	4.64	100.02	0.9865
12	2821 JB-B3-2 T226-7	5/21/88	76.56	12.91	1.12	0.02	0.04	0.53	0.08	4.04	4.72	100.02	0.9865
13	1972 WL-4-58 (144.77m) T164-1	08/17/92	76.73	12.71	1.15	0.00	0.03	0.54	0.12	4.02	4.69	99.99	0.9863
14	760 BO-16	08/17/92	76.59	12.92	1.11	0.03	0.03	0.54	0.07	4.00	4.71	100.00	0.9862
15	2993 SS-91-1-1B	08/17/92	76.49	12.92	1.10	0.02	0.07	0.53	0.05	4.11	4.70	99.99	0.9860
16	750 BC-10	08/12/92	76.27	13.21	1.15	0.03	0.03	0.53	0.07	4.00	4.70	99.99	0.9845
17	2893 SS-91-3-Su(24)	08/12/92	76.33	12.86	1.16	0.02	0.02	0.54	0.02	4.32	4.71	100.00	0.9842
18	758 BO-11	9/3/88	76.35	13.11	1.12	0.03	0.04	0.55	0.09	4.00	4.70	99.99	0.9842
19	2060 FLV-64-CS T170-7	10/22/85	76.71	12.87	1.11	0.02	0.04	0.54	0.04	4.04	4.64	99.99	0.9837
20	1409 KPL 82182 (Al) (599) T112-1	10/21/91	76.60	12.87	1.11	0.04	0.04	0.55	0.06	4.08	4.65	100.00	0.9836
21	2637 JB-B3-9 T241-1	10/21/91	76.42	12.92	1.10	0.01	0.08	0.55	0.05	4.22	4.65	100.00	0.9833
22	2641 JB-B3-14 T241-5	10/21/91	76.55	12.02	1.11	0.02	0.07	0.55	0.06	4.20	4.62	100.00	0.9829
23	2557 SS-91-1-1 T232-2	6/8/91	76.57	12.92	1.07	0.02	0.04	0.54	0.06	4.05	4.72	99.99	0.9828
24	1241 WL-4-2 J.31m T93-10	5/2/85	76.69	12.91	1.14	0.04	0.04	0.55	0.06	3.92	4.67	100.02	0.9826
25	788 GS-32		76.58	12.90	1.13	0.03	0.04	0.56	0.06	4.00	4.70	100.00	0.9826

Plot of calcium vs iron for sample SS-91-1-1

SAMPLE ID: SS-91-1-1B

Date of Analysis: 08/17/92

Raw Probe Data
Raw Probe Data
(FeO to Fe2O3)

Recalculated to 100%

SiO2 74.734
Al2O3 12.628
FeO 0.971*1.1113=Fe2O3 1.079
MgO 0.019
MnO 0.065
CaO 0.521
TiO2 0.051
Na2O 4.013
K2O 4.595

SiO2 76.49
Al2O3 12.92
Fe2O3 1.10
MgO 0.02
MnO 0.07
CaO 0.53
TiO2 0.05
Na2O 4.11
K2O 4.70

TOTAL(O) 97.596 TOTAL(N) 97.704 TOTAL(R) 99.99

Listing of 50 closest matches for COMP. NO. 2993 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 08/21/92

C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total, R	Sim. Co
1	2993 SS-91-1-1B	08/17/92	76.49	12.92	1.10	0.02	0.07	0.53	0.05	4.11	4.70	99.99	1.0000
2	2985 SS-91-1-3-2C	08/17/92	76.58	12.87	1.10	0.01	0.05	0.54	0.06	4.07	4.73	100.01	0.9934
3	2821 JB-B8-2 T226-7	6/24/92	76.56	12.91	1.12	0.02	0.04	0.53	0.08	4.04	4.72	100.02	0.9932
4	2638 JB-B8-11 T241-2	10/21/91	76.55	12.80	1.10	0.02	0.08	0.54	0.06	4.16	4.68	99.99	0.9925
5	2974 SS-91-4-9uA	08/17/92	76.60	12.86	1.10	0.02	0.05	0.54	0.06	4.04	4.74	100.01	0.9918
6	2639 JB-B8-12 T241-3	10/21/91	76.51	12.95	1.11	0.03	0.08	0.54	0.05	4.16	4.67	100.00	0.9914
7	2716 FLV-200-LC T249-4	1/30/92	76.77	12.00	1.11	0.02	0.04	0.53	0.06	4.01	4.67	100.01	0.9917
8	760 BO-16		76.59	12.92	1.11	0.03	0.03	0.54	0.07	4.00	4.71	100.00	0.9904
9	366 KRL9102B, T64-12	08/06/82	76.81	12.82	1.10	0.01	0.05	0.53	0.08	3.91	4.62	100.00	0.9876
10	2957 SS-91-4-4D	08/17/92	76.75	12.81	1.11	0.03	0.02	0.52	0.05	4.07	4.63	99.99	0.9851
11	2557 SS-91-1-1 T232-2	6/8/91	76.57	12.92	1.07	0.02	0.04	0.54	0.06	4.05	4.72	99.99	0.9831
12	2986 SS-91-3-3A	08/17/92	76.64	12.79	1.13	0.02	0.04	0.54	0.06	4.08	4.71	100.01	0.9889
13	2995 SS-91-1-3B	08/17/92	76.71	12.69	1.09	0.02	0.05	0.52	0.04	4.17	4.72	100.01	0.9808
14	1409 KSL 82182 (Al) (599) T112-1	10/23/85	76.60	12.87	1.11	0.04	0.04	0.55	0.06	4.08	4.65	100.00	0.9806
15	2060 FLV-64-CS T170-7	9/5/88	76.71	12.87	1.11	0.02	0.04	0.54	0.04	4.02	4.64	99.99	0.9805
16	431 YOS-1, T13-1	08/17/92	76.61	12.93	1.12	0.03	0.05	0.54	0.07	4.03	4.64	100.02	0.9802
17	2979 SS-91-1-5B	08/17/92	76.42	13.14	1.09	0.03	0.05	0.52	0.05	4.04	4.66	100.00	0.9801
18	3001 SS-91-4-1A	08/17/92	76.70	12.72	1.12	0.02	0.04	0.54	0.05	4.08	4.71	100.02	0.9874
19	2640 JB-B8-13 T241-4	10/21/91	76.49	12.83	1.08	0.03	0.08	0.53	0.06	4.26	4.64	100.00	0.9870
20	2637 JB-B8-9 T241-1	10/21/91	76.42	12.92	1.10	0.01	0.08	0.55	0.05	4.22	4.65	100.00	0.9877
21	2717 FLV-201-TO T249-5	1/30/92	76.85	12.77	1.10	0.02	0.04	0.54	0.04	3.99	4.65	100.00	0.9876
22	2570 JB-B8-7 T227-4	6/13/91	76.73	12.89	1.10	0.03	0.05	0.54	0.06	3.91	4.69	100.00	0.9875
23	2645 JB-WA-1 T242-1	10/21/91	76.77	12.70	1.09	0.02	0.07	0.53	0.06	4.19	4.57	100.00	0.9872
24	2558 SS-91-1-SU T232-1	8/6/91	76.74	12.86	1.09	0.04	0.04	0.54	0.05	3.95	4.68	99.99	0.9862
25	2964 SS-91-2-3C	08/17/92	76.76	12.67	1.10	0.01	0.04	0.53	0.04	4.26	4.60	100.01	0.9868
26	2994 SS-91-1-2B	08/17/92	76.51	12.97	1.04	0.03	0.06	0.54	0.06	4.12	4.69	100.02	0.9864
27	2962 SS-91-1-3UB	08/17/92	76.26	12.99	1.14	0.04	0.05	0.54	0.08	4.15	4.76	100.01	0.9860
28	1419 BL-RSA-5 T112-10	10/23/85	76.98	12.63	1.09	0.04	0.04	0.53	0.05	3.91	4.68	99.99	0.9859
29	631 FSL-918B2A, T66-8	10/23/83	76.79	12.03	1.10	0.03	0.06	0.54	0.07	3.91	4.67	100.00	0.9857
30	561 FSL02202A, T66-5	10/25/83	76.71	12.00	1.12	0.04	0.05	0.52	0.06	3.90	4.65	100.01	0.9854

Plot calcium vs iron for sample SS-91-1-2

SAMPLE ID: SS-91-1-2A

Date of Analysis: 08/17/92

Raw Probe Data
Raw Probe Data
(FeO to Fe2O3)

Recalculated to 100%

SiO2	74.744	SiO2	76.49
Al2O3	12.708	Al2O3	13.01
FeO	0.777*1.1113=Fe2O3	Fe2O3	0.88
MgO	0.051	MgO	0.05
MnO	0.077	MnO	0.08
CaO	0.646	CaO	0.66
TiO2	0.044	TiO2	0.05
Na2O	3.926	Na2O	4.02
K2O	4.655	K2O	4.76

TOTAL (O) 97.629 TOTAL (N) 97.716 TOTAL (R) 100.00

Listing of 50 closest matches for COMP. NO. 2976 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 08/21/92
C.No Sample Number Date SiO2 Al2O3 Fe2O3 MgO MnO CaO TiO2 Na2O K2O Total.R Sim. Co

1	2976	SS-91-1-2A	08/17/92	76.49	13.01	0.98	0.05	0.08	0.66	0.05	4.02	4.76	100.00	1.0000
2	2997	SS-91-2-3A	08/17/92	76.52	12.95	0.90	0.03	0.04	0.66	0.03	4.07	4.80	100.00	0.9920
3	2921	SS-91-4-4(36)	08/13/92	76.88	12.80	0.87	0.07	0.02	0.66	0.06	3.93	4.72	100.01	0.9894
4	695	RSC31		76.02	12.90	0.93	0.01	0.00	0.66	0.03	4.00	4.70	99.99	0.9993
5	2711	FLV-196-BC T246-5	12/12/91	76.65	12.80	0.90	0.05	0.04	0.67	0.00	3.95	4.78	100.00	0.9902
6	455	679-409-6, T31-1		76.71	13.04	0.98	0.03	0.03	0.66	0.07	3.70	4.00	100.00	0.9878
7	2924	SS-91-1-2(6)	08/13/92	76.54	12.93	0.92	0.04	0.05	0.67	0.02	4.00	4.83	100.00	0.9859
8	2945	SS-91-4-5(43)	08/13/92	76.60	12.91	0.91	0.05	0.05	0.68	0.08	3.96	4.75	100.00	0.9852
9	2709	FLV-194-BC T246-3	12/12/91	76.50	12.97	0.88	0.05	0.05	0.72	0.06	4.00	4.75	99.98	0.9844
10	2947	SS-91-4-5(49)	08/13/92	76.53	13.06	0.83	0.01	0.01	0.65	0.00	3.99	4.81	99.99	0.9841
11	2952	SS-91-1-8(48)	08/13/92	76.55	13.06	0.90	0.07	0.07	0.66	0.07	3.78	4.85	100.01	0.9825
12	2958	SS-91-4-5A	08/17/92	76.45	13.09	0.91	0.04	0.03	0.69	0.07	3.94	4.78	100.00	0.9821
13	573	FLV1982-K, T64-15	09/06/83	76.84	13.01	0.90	0.02	0.05	0.66	0.06	3.70	4.75	99.99	0.9819
14	2931	SS-91-1-5(33)	08/13/92	76.30	13.36	0.84	0.04	0.05	0.65	0.07	3.98	4.70	99.99	0.9814
15	545	FLV1982-17, T50-4	02/01/83	76.61	13.14	0.87	0.03	0.04	0.68	0.05	3.77	4.79	99.98	0.9799
16	2712	FLV-197-BC T246-6	12/12/91	76.46	12.98	0.98	0.04	0.05	0.65	0.06	4.02	4.77	100.01	0.9797
17	2941	SS-91-4-5(15)	08/13/92	76.34	13.25	0.90	0.03	0.03	0.70	0.07	3.95	4.73	100.00	0.9795
18	2946	SS-91-4-5(47)	08/13/92	76.55	13.03	0.93	0.04	0.00	0.68	0.04	3.91	4.82	100.00	0.9791
19	2948	SS-91-1-7(27)	08/13/92	76.50	13.05	0.86	0.04	0.07	0.67	0.08	3.81	4.93	100.01	0.9787
20	2912	SS-91-4-3(15)	08/13/92	76.36	13.15	0.87	0.07	0.04	0.73	0.05	4.01	4.72	100.00	0.9783
21	2644	JB-B9-17 T241-8	10/21/91	76.22	13.28	0.84	0.04	0.08	0.70	0.05	4.04	4.76	100.01	0.9781
22	191	LD-10, T40-2		76.71	13.04	0.91	0.04	0.03	0.68	0.07	3.80	4.71	99.99	0.9779
23	1974	WL-5-5 (36.93m) T164-3	5/21/88	76.69	13.09	0.83	0.03	0.05	0.66	0.06	3.79	4.82	100.02	0.9775
24	180	FLV1982-11L, T44-B		76.76	13.01	0.92	0.02	0.03	0.63	0.04	3.89	4.70	100.00	0.9771
25	1975	WL-5-6 (39.31m) T164-4	5/21/88	76.69	13.10	0.82	0.04	0.05	0.66	0.07	3.79	4.70	100.00	0.9768

Recalculated to 100%

Raw Probe Data
(FeO to Fe2O3)

Raw Probe Data

	SiO ₂	74.550		SiO ₂	76.51
	Al ₂ O ₃	12.636		Al ₂ O ₃	12.97
	FeO	0.903*	1.1113=Fe ₂ O ₃	Fe ₂ O ₃	1.04
	MgO	0.026		MgO	0.03
	MnO	0.058		MnO	0.06
	CaO	0.524		CaO	0.54
	TiO ₂	0.056		TiO ₂	0.06
	Na ₂ O	4.011		Na ₂ O	4.12
	K ₂ O	4.570		K ₂ O	4.69

TOTAL (O)	97,340	TOTAL (N)	97,441	TOTAL (R)	100.02
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TOTAL (R)

Listing of 50 closest matches for COMP. NO. 2994 for elements. Na, Al, Si, K, Ca, Fe Date of Update: 08/21/92														K2O Total, R Sim. Co			
C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total	R	Sim.	Co		
1	2994 SS-91-1-2B	08/17/92	76.51	12.97	1.04	0.03	0.06	0.54	0.06	4.12	4.69	100.02	1.0000				
2	435 3-30-82-1, T43-3		76.62	12.93	1.06	0.02	0.05	0.54	0.07	4.13	4.59	100.01	0.9921				
3	3005 SS-91-1-2B	08/17/92	76.45	12.92	1.07	0.01	0.04	0.55	0.07	4.15	4.76	100.00	0.9910				
4	2557 SS-91-1-1 T232-2	6/8/91	76.57	12.92	1.05	0.02	0.04	0.54	0.06	4.05	4.72	99.99	0.9907				
5	2820 JB-B8-1 T226-6	6/24/92	76.70	12.80	1.06	0.02	0.04	0.54	0.06	4.05	4.72	99.99	0.9904				
6	2643 JB-B8-16 T241-7	10/21/91	76.55	12.59	1.04	0.02	0.08	0.54	0.05	4.16	4.58	100.00	0.9898				
7	2638 JB-B8-11 T241-2	10/21/91	76.55	12.80	1.10	0.02	0.08	0.54	0.06	4.13	4.68	99.99	0.9867				
8	2993 SS-91-1-1B	08/17/92	76.49	12.92	1.10	0.02	0.07	0.53	0.05	4.11	4.70	99.99	0.9864				
9	2567 JB-B8-4 T227-1	6/13/91	76.75	12.83	1.04	0.03	0.06	0.55	0.06	3.95	4.73	100.00	0.9864				
10	2563 SS-91-1-Adgse	8/7/91	76.73	12.85	1.04	0.03	0.05	0.53	0.07	3.95	4.74	99.99	0.9863				
11	2985 SS-91-3-2C	08/17/92	76.50	12.87	1.10	0.01	0.05	0.54	0.06	4.07	4.73	100.01	0.9860				
12	562 KSL82282A(P), T66-6	xx/xx/83	76.06	12.05	1.05	0.03	0.06	0.54	0.05	3.87	4.70	100.01	0.9856				
13	2639 JB-B8-12 T241-3	10/21/91	76.51	12.85	1.11	0.03	0.08	0.54	0.05	4.16	4.67	100.00	0.9851				
14	2961 SS-91-1-7A	08/17/92	76.64	12.93	1.06	0.02	0.05	0.54	0.06	4.04	4.74	100.01	0.9843				
15	2974 SS-91-4-SUA	08/17/92	76.60	12.86	1.10	0.02	0.05	0.54	0.06	4.04	4.74	100.01	0.9843				
16	3004 SS-91-3-2A	08/17/92	76.73	12.76	1.00	0.01	0.04	0.53	0.05	4.06	4.70	100.00	0.9843				
17	2955 SS-91-2SUA	08/17/92	76.73	12.64	1.03	0.03	0.04	0.54	0.06	4.31	4.63	100.01	0.9842				
18	2642 JB-B8-15 T241-6	10/21/91	76.59	12.83	1.08	0.03	0.07	0.54	0.04	4.23	4.59	100.00	0.9840				
19	2980 SS-91-1-6B	08/17/92	76.58	13.01	1.07	0.03	0.05	0.54	0.06	3.91	4.76	100.01	0.9837				
20	2973 SS-91-4-5B	08/17/92	76.52	12.75	1.06	0.04	0.04	0.53	0.06	4.05	4.58	100.03	0.9833				
21	2558 SS-91-1-SU T232-1	8/6/91	76.74	12.86	1.09	0.04	0.04	0.54	0.05	3.95	4.68	99.99	0.9832				
22	760 BO-16		76.59	12.92	1.11	0.03	0.03	0.54	0.07	4.00	4.71	100.00	0.9831				
23	1806 OB-ME-65CM T143-7	6/24/87	76.81	12.80	1.05	0.03	0.05	0.56	0.05	3.96	4.70	100.01	0.9828				
24	2559 SS-91-1-2 T232-3	8/7/91	77.11	12.63	1.03	0.03	0.05	0.54	0.06	3.89	4.67	100.01	0.9827				
25	559 KSL82182(bubble wall), T56-4	07/01/83	76.87	12.92	1.01	0.02	0.03	0.53	0.03	4.03	4.55	99.99	0.9821				
26	3006 SS-91-4-2B	08/17/92	76.94	12.60	1.03	0.04	0.04	0.51	0.04	4.13	4.66	99.99	0.9820				
27	2060 FLV-64-C9 T170-7	9/3/88	76.71	12.87	1.11	0.02	0.04	0.54	0.04	4.02	4.64	99.99	0.9819				
28	431 YOS-1, T13-1		76.61	12.93	1.12	0.03	0.05	0.54	0.07	4.03	4.64	100.02	0.9819				
29	1409 KSL 82182 (A1) (599) T112-1	10/22/85	76.60	12.87	1.11	0.04	0.04	0.55	0.06	4.08	4.65	100.00	0.9819				
30	3009 SS-91-1-8C	08/21/92	76.68	12.93	1.08	0.01	0.05	0.54	0.06	3.90	4.75	100.00	0.9819				
31	2707 FLV-192-BC T246-1	12/12/91	77.01	12.55	1.05	0.03	0.05	0.53	0.05	4.18	4.56	100.01	0.9818				
32	2986 SS-91-3-3A	08/17/92	76.64	12.79	1.13	0.02	0.04	0.54	0.06	4.08	4.71	100.01	0.9818				
33	2978 SS-91-1-4A	08/17/92	76.58	13.14	1.02	0.03	0.04	0.51	0.06	4.08	4.74	100.00	0.9817				
34	2637 JB-B8-9 T241-1	10/21/91	76.82	12.92	1.10	0.01	0.08	0.55	0.05	4.22	4.65	100.00	0.9817				
35	2640 JB-B8-13 T241-4	10/21/91	76.49	12.83	1.08	0.03	0.08	0.53	0.06	4.26	4.64	100.00	0.9816				
36	1225 WL CORE G 380cm T92-8	5/2/85	76.82	12.79	1.06	0.04	0.04	0.56	0.06	4.00	4.65	100.02	0.9816				
37	2562 SS-91-1-5 T232-6	8/7/91	76.97	12.65	1.08	0.03	0.04	0.54	0.07	3.98	4.65	100.01	0.9816				
38	1224 WL CORE G 370cm T92-7	5/2/85	76.93	12.82	1.09	0.04	0.04	0.54	0.05	3.95	4.65	100.01	0.9814				
39	1141 WL-2-3-1.94M T85-1	12/4/84	76.97	12.65	1.05	0.03	0.05	0.56	0.05	4.00	4.66	100.02	0.9814				
40	2793 FLV-209-BC T234-6	4/14/92	76.36	13.11	1.09	0.03	0.06	0.55	0.07	4.01	4.73	100.01	0.9814				
41	2561 SS-91-1-4 T223-5	8/7/91	77.02	12.63	1.06	0.02	0.04	0.53	0.06	4.00	4.63	99.99	0.9813				
42	682 KSL-91882C, T66-11	10/25/83	76.91	12.76	1.07	0.03	0.06	0.54	0.07	3.87	4.68	99.99	0.9813				
43	679 KSL-82182(A-4), T66-3	10/25/83	76.99	12.82	1.02	0.02	0.05	0.52	0.04	4.08	4.55	99.99	0.9813				
44	2493 FLV-136-93 T219-3	12/20/90	76.54	13.06	1.09	0.03	0.04	0.54	0.05	3.94	4.62	100.01	0.9812				
45	2962 SS-91-1-SUB	08/17/92	76.26	12.99	1.14	0.04	0.05	0.54	0.08	4.15	4.76	100.01	0.9809				
46	2717 FLV-201-TO T249-5	1/30/92	76.85	12.77	1.10	0.02	0.04	0.54	0.04	3.99	4.65	100.00	0.9809				
47	2570 JB-B8-7 T227-4	6/13/91	76.73	12.89	1.10	0.03	0.05	0.54	0.06	3.91	4.69	100.00	0.9809				
48	3001 SS-91-4-1A	08/17/92	76.70	12.72	1.12	0.02	0.04	0.54	0.05	4.08	4.75	100.02	0.9807				
49	554 KSL82182(A-3), T56-4	07/01/83	76.97	12.82	1.02	0.03	0.03	0.55	0.04	4.09	4.44	99.99	0.9807				

Plot calcium vs iron for sample SS-91-1-3

DATE OF ANALYSIS: 08/17/92

SAMPLE ID: SS-91-1-3A

Recalculated to 100%

Raw Probe Data
(FeO to Fe2O3)

Raw Probe Data

SiO2	73.888	SiO2	76.67
Al2O3	12.166	Al2O3	12.62
FeO	0.940*1.1113=Fe2O3	Fe2O3	1.08
MgO	0.034	MgO	0.03
MnO	0.046	MnO	0.05
CaO	0.538	CaO	0.56
TiO2	0.047	TiO2	0.05
Na2O	4.022	Na2O	4.17
K2O	4.593	K2O	4.77

TOTAL(R) 100.00

TOTAL(N) 96.377

TOTAL(O) 96.273

Listing of 50 closest matches for COMP. NO. 2977 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 08/21/92

C. No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	CaO	FeO	Na2O	K2O	Total, R	Sim. Co
1	2977 SS-91-1-3A	08/17/92	76.67	12.62	1.08	0.03	0.05	0.56	0.05	4.17	4.77	100.00
2	2969 SS-91-4-2C	08/17/92	76.97	12.56	1.08	0.02	0.02	0.56	0.04	4.08	4.65	99.98
3	3005 SS-91-3-2B	08/17/92	76.45	12.92	1.05	0.01	0.04	0.55	0.07	4.15	4.76	100.00
4	2638 JB-B9-11 T241-2	10/21/91	76.55	12.80	1.10	0.02	0.00	0.54	0.06	4.16	4.60	99.99
5	2995 SS-91-1-3B	08/17/92	76.71	12.69	1.09	0.02	0.05	0.52	0.04	4.17	4.72	100.01
6	1141 WL-2-3-1.94M T85-1	12/4/84	76.97	12.65	1.05	0.03	0.05	0.56	0.05	4.00	4.66	100.02
7	2637 JB-B9-9 T241-1	10/21/91	76.42	12.92	1.10	0.01	0.08	0.55	0.05	4.22	4.65	100.00
8	1225 WL CORE G 380CM T92-8	5/2/85	76.82	12.79	1.06	0.04	0.04	0.56	0.06	4.00	4.65	100.02
9	2641 JB-B9-14 T241-5	10/21/91	76.55	12.82	1.11	0.02	0.07	0.55	0.06	4.20	4.62	100.00
10	2642 JB-B9-15 T241-6	10/21/91	76.59	12.83	1.08	0.03	0.07	0.54	0.04	4.23	4.59	100.00
11	3001 SS-91-4-1A	08/17/92	76.70	12.72	1.12	0.02	0.04	0.54	0.05	4.08	4.75	100.02
12	2639 JB-B9-12 T241-3	10/21/91	76.51	12.85	1.11	0.03	0.08	0.54	0.05	4.16	4.67	100.00
13	2682 JB-B9-9 T241-1	10/21/91	76.15	13.07	1.11	0.01	0.08	0.56	0.05	4.27	4.70	100.00
14	2953 SS-91-2-1A	08/17/92	76.61	12.67	1.07	0.01	0.04	0.57	0.03	4.37	4.63	100.00
15	2905 SS-91-3-2C	08/17/92	76.58	12.87	1.10	0.01	0.05	0.54	0.06	4.07	4.73	100.01
16	1142 WL-2-3-2.14M T85-2	12/4/84	76.97	12.69	1.06	0.03	0.05	0.56	0.06	3.96	4.63	100.01
17	2820 JB-B9-1 T226-6	6/24/92	76.70	12.80	1.06	0.02	0.04	0.54	0.06	4.05	4.72	99.99
18	1806 OD-ML-65CM T143-7	6/24/87	76.81	12.80	1.05	0.03	0.05	0.56	0.05	3.96	4.70	100.01
19	1418 BL-P9A-4 T112-9	10/23/85	76.83	12.79	1.08	0.04	0.04	0.55	0.06	3.96	4.65	100.00
20	2557 SS-91-1-1 T232-2	6/8/91	76.57	12.92	1.07	0.02	0.04	0.54	0.06	4.05	4.72	99.99
21	2708 FLV-193-BC T246-2	12/12/91	76.75	12.61	1.16	0.04	0.06	0.56	0.06	4.11	4.65	100.00
22	2974 SS-91-4-9uA	08/17/92	76.60	12.86	1.10	0.02	0.05	0.54	0.06	4.04	4.74	100.01
23	1409 FRL 82182 (A1)	10/22/85	76.60	12.87	1.11	0.04	0.04	0.55	0.06	4.08	4.65	100.00
24	2562 SS-91-1-5 T232-6	8/7/91	76.97	12.65	1.08	0.03	0.04	0.54	0.07	3.98	4.65	100.01
25	1310 WL 8-2B 172-174.5CM T99-10	7/1/85	76.90	12.74	1.05	0.02	0.05	0.56	0.07	3.91	4.71	100.01

Plot calcium vs iron for sample SS-91-1-4

SAMPLE ID: SS-91-1-4A

Date of Analysis: 08/17/92

Raw Probe Data

Raw Probe Data
(FeO to $\pm 2\text{O}_3$)

Recalculated to 100%

SiO₂ 74.147
Al₂O₃ 12.758
FeO 0.896*1.1113=Fe₂O₃ 0.995
MgO 0.028
MnO 0.037
CaO 0.494
TiO₂ 0.057
Na₂O 3.964
K₂O 4.600
TOTAL(O) 96.980

SiO₂ 76.38
Al₂O₃ 13.14
Fe₂O₃ 1.02
MgO 0.03
MnO 0.04
CaO 0.51
TiO₂ 0.06
Na₂O 4.08
K₂O 4.74
TOTAL(R) 100.00

Listing of 50 closest matches for COMP. NO. 2978 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 08/21/92

C.No	Sample Number	Date	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	MgO	MnO	CaO	TiO ₂	Na ₂ O	K ₂ O	Total, R	Sim. Co
1	2978 SS-91-1-4A	08/17/92	76.39	13.14	1.02	0.03	0.04	0.51	0.06	4.08	4.74	100.00	1.0000
2	3006 SS-91-4-2B	08/17/92	76.94	12.60	1.03	0.04	0.04	0.51	0.04	4.13	4.66	99.99	0.9855
3	679 KRL-02182(A-4), T66-3	10/25/83	76.89	12.82	1.02	0.02	0.05	0.52	0.04	4.08	4.55	99.99	0.9849
4	2959 SS-91-1-5A	08/17/92	76.66	13.08	0.97	0.02	0.05	0.51	0.04	4.03	4.64	100.00	0.9839
5	3003 SS-91-4-4C	08/17/92	77.01	12.67	1.02	0.03	0.03	0.52	0.05	4.00	4.59	100.00	0.9842
6	753 BO-1	08/17/92	76.43	13.11	1.09	0.03	0.04	0.51	0.07	4.00	4.70	100.00	0.9841
7	3004 SS-91-3-2A	08/17/92	76.93	12.76	1.00	0.01	0.04	0.53	0.05	4.06	4.70	100.00	0.9824
8	2994 SS-91-1-2B	08/17/92	76.51	12.97	1.04	0.03	0.06	0.54	0.06	4.12	4.69	100.02	0.9817
9	2979 SS-91-1-5B	08/17/92	76.42	13.14	1.09	0.03	0.05	0.52	0.05	4.04	4.66	100.00	0.9816
10	3008 SS-91-1-8B	08/21/92	76.71	12.96	0.98	0.02	0.06	0.52	0.06	3.93	4.75	99.99	0.9808
11	2563 SS-91-1-Adgss	8/7/91	76.73	12.85	1.04	0.03	0.05	0.53	0.07	3.95	4.74	99.99	0.9808
12	559 KRL82182(bubble wall), T56-4	07/01/83	76.87	12.92	1.01	0.02	0.03	0.53	0.03	4.03	4.55	99.99	0.9795
13	2968 SS-91-3-SuA	08/17/92	76.56	12.75	1.02	0.02	0.05	0.51	0.04	4.41	4.63	99.99	0.9783
14	2779 FLV-207-LC T252-6	3/10/92	77.22	12.60	1.01	0.01	0.05	0.51	0.06	3.95	4.56	99.97	0.9781
15	2557 SS-91-1-1 T232-2	6/8/91	76.57	12.92	1.07	0.02	0.04	0.54	0.06	4.05	4.72	99.99	0.9778
16	2981 SS-91-1-7B	08/17/92	76.66	13.02	0.97	0.01	0.06	0.49	0.07	3.96	4.76	100.00	0.9776
17	2820 JB-B9-1 T226-6	6/24/92	76.70	12.80	1.06	0.02	0.04	0.54	0.06	4.05	4.72	99.99	0.9775
18	755 BO-3	08/17/92	76.43	13.02	1.10	0.03	0.04	0.49	0.08	4.11	4.71	100.01	0.9774
19	2963 SS-91-2-1B	08/17/92	76.57	12.72	1.05	0.02	0.05	0.51	0.07	4.34	4.68	100.01	0.9774
20	3005 SS-91-3-2B	08/17/92	76.45	12.92	1.05	0.01	0.04	0.55	0.07	4.15	4.76	100.00	0.9767
21	762 BO-19	08/17/92	76.82	13.02	1.00	0.02	0.03	0.53	0.06	3.91	4.61	100.00	0.9765
22	623 TULELAKE-296(200-325), T62-5	08/25/83	76.54	13.06	1.06	0.06	0.05	0.48	0.09	3.93	4.74	100.01	0.9764
23	1421 BL-RSA-7 T112-12	10/23/85	77.16	12.66	1.03	0.04	0.05	0.52	0.03	3.95	4.57	100.01	0.9761
24	2989 SS-91-4-3B	08/17/92	77.09	12.63	0.97	0.02	0.03	0.52	0.05	4.08	4.61	100.00	0.9761
25	2993 SS-91-1-1B	08/17/92	76.49	12.92	1.10	0.02	0.07	0.53	0.05	4.11	4.70	99.99	0.9759
26	2975 SS-91-1-1A	08/17/92	76.75	12.90	0.90	0.03	0.07	0.51	0.05	4.07	4.73	100.01	0.9758
27	2384 FLV-142-TC T203-8	4/16/90	77.51	12.24	1.03	0.00	0.06	0.51	0.08	3.90	4.60	100.01	0.9755
28	2995 SS-91-1-3B	08/17/92	76.71	12.69	1.09	0.02	0.05	0.52	0.04	4.17	4.72	100.01	0.9754
29	569 KRL91802A, T66-9	xx/xx/83	76.70	12.95	1.01	0.03	0.06	0.53	0.06	3.83	4.84	100.01	0.9753
30	1423 BL-RSA-9 T112-14	10/23/85	77.13	12.00	1.02	0.03	0.03	0.52	0.04	3.87	4.54	99.98	0.9753

Plot calcium vs iron for sample SS-91-1-5

Date of Analysis: 08/17/92

SAMPLE ID: SS-91-1-5A

Recalculated to 100%

Raw Probe Data
(FeO to Fe2O3)

SiO2	73.670	SiO2	76.66
Al2O3	12.570	Al2O3	13.08
FeO	0.839+1.1113=Fe2O3	Fe2O3	0.97
MgO	0.022	MgO	0.02
MnO	0.044	MnO	0.05
CaO	0.492	CaO	0.51
TiO2	0.037	TiO2	0.04
Na2O	3.872	Na2O	4.03
K2O	4.461	K2O	4.64

TOTAL(R) 100.00

TOTAL(N) 96.093

TOTAL(O) 96.000

Listing of 50 closest matches for COMP. NO. 2959 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 08/21/92

C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total, R	Sim. Co
1	2959 SS-91-1-5A	08/17/92	76.66	13.08	0.97	0.02	0.05	0.51	0.04	4.03	4.64	100.00	1.0000
2	2989 SS-91-4-3B	08/17/92	77.09	12.43	0.97	0.02	0.03	0.52	0.05	4.08	4.61	100.00	0.9870
3	2981 SS-91-1-7B	08/17/92	76.64	13.02	0.97	0.01	0.06	0.49	0.07	3.96	4.76	100.00	0.9856
4	3008 SS-91-1-8B	08/21/92	76.71	12.96	0.90	0.02	0.06	0.52	0.06	3.93	4.75	99.99	0.9855
5	2237 SL-262.5 T186-4	2/28/89	76.96	12.94	0.96	0.03	0.04	0.52	0.06	3.87	4.62	100.00	0.9853
6	2978 SS-91-1-4A	08/17/92	76.38	13.14	1.02	0.03	0.04	0.51	0.06	4.08	4.74	100.00	0.9849
7	1420 BL-R8A-6 T112-11	10/23/85	77.08	12.78	0.97	0.02	0.04	0.53	0.04	3.97	4.56	99.99	0.9836
8	2194 FLV-107-TC T182-3	1/24/89	76.81	13.14	0.92	0.03	0.02	0.51	0.06	3.86	4.64	99.99	0.9833
9	3002 SS-91-4-2A	08/17/91	77.10	12.61	0.95	0.02	0.02	0.52	0.03	4.09	4.66	100.00	0.9828
10	2972 SS-91-4-4Z	08/17/92	77.05	12.74	0.98	0.03	0.03	0.49	0.03	4.07	4.58	100.00	0.9828
11	2954 SS-91-2-3B	08/17/92	77.04	12.71	0.94	0.01	0.04	0.51	0.05	4.13	4.57	100.00	0.9825
12	2174 KRL-82982-O (MIN-1) T178-9	12/6/88	76.72	13.16	0.97	0.02	0.00	0.55	0.02	3.97	4.59	100.00	0.9822
13	2761 FLV-208A-LC T250-5	2/26/92	76.75	12.77	0.97	0.02	0.04	0.51	0.04	4.33	4.58	100.01	0.9816
14	762 BO-19		76.82	13.02	1.00	0.02	0.03	0.53	0.06	3.91	4.61	100.00	0.9816
15	559 KRL82182(bubble wall), T56-4	07/01/83	76.87	12.92	1.01	0.02	0.03	0.53	0.03	4.03	4.55	99.99	0.9814
16	1309 WL 8-7 T91-12	3/1/85	77.42	12.57	0.96	0.02	0.05	0.51	0.04	3.93	4.51	100.01	0.9813
17	2093 KRL-82882-M T174-2	10/6/88	77.27	12.68	0.97	0.02	0.04	0.52	0.05	3.82	4.63	100.00	0.9813
18	2167 KRL-82982-J T178-3	12/6/88	76.86	13.03	0.96	0.02	0.05	0.52	0.05	3.79	4.72	100.00	0.9813
19	2802 FLV-165-CH T255-5	4/15/92	76.64	13.03	0.92	0.02	0.06	0.49	0.08	4.04	4.72	100.00	0.9810
20	3004 SS-91-3-2A	08/17/92	76.85	12.76	1.00	0.01	0.04	0.53	0.05	4.06	4.70	100.00	0.9809
21	2975 SS-91-1-1A	08/17/92	76.75	12.90	0.90	0.03	0.07	0.51	0.05	4.07	4.73	100.01	0.9807
22	1231 WL 8-7 62-64.5cm T92-15	5/1/85	77.25	12.78	0.98	0.03	0.05	0.51	0.05	3.76	4.59	100.00	0.9802
23	2029 KRL-82882-I T168-14	7/20/88	77.12	12.63	0.95	0.02	0.04	0.53	0.05	3.98	4.68	100.00	0.9801
24	2779 FLV-207-LC T252-6	3/10/92	77.22	12.60	1.01	0.01	0.05	0.51	0.06	3.95	4.56	99.97	0.9799
25	679 KRL-82182(A-4), T66-3	10/25/83	76.89	12.82	1.02	0.02	0.05	0.52	0.04	4.04	4.54	99.99	0.9795

Plot calcium vs iron for sample SS-91-1-6

SAMPLE ID: SS-91-1-6A

Date of Analysis: 08/17/92

Recalculated to 100%

Raw Probe Data
(FeO to F2O3)

SiO2 76.66
Al2O3 13.06
Fe2O3 0.93
MgO 0.02
MnO 0.05
CaO 0.52
TiO2 0.06
Na2O 3.90
K2O 4.79

SiO2 72.783
Al2O3 12.403
FeO 0.795*1.1113=Fe2O3 0.884
MgO 0.015
MnO 0.048
CaO 0.497
TiO2 0.060
Na2O 3.702
K2O 4.545

TOTAL (R) 99.99

TOTAL (N) 94.938

TOTAL (O) 94.849

Listing of 50 closest matches for COMP. NO. 2960 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 08/21/92

C. No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total, R	Sim. Co
1	2960 SS-91-1-6A	08/17/92	76.66	13.06	0.93	0.02	0.05	0.52	0.06	3.90	4.79	99.99	1.0000
2	3008 SS-91-1-8B	08/21/92	76.71	12.96	0.98	0.02	0.06	0.52	0.06	3.93	4.75	99.99	0.9874
3	2171 KRL-82982-M T178-7	12/6/88	77.04	12.92	0.91	0.00	0.00	0.52	0.05	3.82	4.70	100.01	0.9073
4	2167 KRL-82982-J T178-3	12/6/88	76.06	13.03	0.96	0.03	0.00	0.52	0.05	3.73	4.73	100.00	0.9070
5	2194 FLV-101-TC T182-3	1/24/89	76.81	13.14	0.92	0.03	0.00	0.51	0.06	3.86	4.64	99.99	0.9867
6	2237 SL-262.5 T186-4	2/28/89	76.96	12.94	0.96	0.03	0.00	0.52	0.06	3.87	4.62	100.00	0.9854
7	2170 KRL-82982-L T178-6	12/6/88	77.06	12.90	0.90	0.01	0.05	0.52	0.07	3.88	4.62	100.01	0.9849
8	2030 KRL-82982-K T168-15	7/20/88	77.14	12.53	0.94	0.03	0.05	0.53	0.06	3.69	4.81	100.02	0.9829
9	2108 KRL-82982-D T174-12	10/28/88	77.13	12.80	0.93	0.02	0.05	0.53	0.06	3.76	4.94	100.00	0.9828
10	2099 CRAW-88-3G (HI Fe, Ca) T173-2	10/6/88	76.63	12.99	0.96	0.06	0.04	0.52	0.10	3.76	4.94	100.00	0.9815
11	2109 KRL-82982-E T174-13	10/28/88	76.93	12.90	0.92	0.02	0.05	0.55	0.08	3.84	4.72	100.01	0.9801
12	2975 SS-91-1-1A	08/17/92	76.75	12.90	0.90	0.03	0.07	0.51	0.05	4.07	4.73	100.01	0.9800
13	2802 FLV-165-CH T255-5	4/15/92	76.64	13.03	0.92	0.02	0.06	0.49	0.08	4.04	4.72	100.00	0.9797
14	2029 KRL-82982-I T168-14	7/20/88	77.12	12.63	0.95	0.02	0.04	0.53	0.05	3.98	4.68	100.00	0.9796
15	2098 KRL-82982-S T174-7	10/6/88	77.25	12.70	0.96	0.02	0.04	0.52	0.06	3.73	4.73	100.01	0.9794
16	2981 SS-91-1-7B	08/17/92	76.66	13.02	0.97	0.01	0.06	0.49	0.07	3.96	4.76	100.00	0.9791
17	2959 SS-91-1-5A	08/17/92	76.66	13.08	0.97	0.02	0.05	0.51	0.04	4.03	4.64	100.00	0.9785
18	3007 SS-91-1-8A	08/21/92	76.92	12.96	0.85	0.02	0.04	0.51	0.05	3.91	4.74	100.00	0.9780
19	2093 KRL-82982-M T174-2	10/6/88	77.27	12.68	0.97	0.02	0.04	0.52	0.06	3.91	4.61	100.00	0.9776
20	762 BO-19		76.82	13.02	1.00	0.02	0.03	0.53	0.06	3.91	4.61	100.00	0.9775
21	3002 SS-91-4-2A	08/17/91	77.10	12.61	0.95	0.02	0.06	0.53	0.06	3.83	4.84	100.01	0.9775
22	569 KRL91982A, T66-9	xx/xx/83	76.70	12.95	1.01	0.03	0.04	0.51	0.06	3.99	4.77	99.99	0.9767
23	2026 KRL-82982-FWC T168-11	7/20/88	77.32	12.37	0.90	0.03	0.04	0.51	0.06	3.74	4.79	99.98	0.9758
24	565 KRL82782E, T66-7	xx/xx/83	77.19	12.71	0.90	0.04	0.06	0.50	0.05	3.74	4.69	100.00	0.9751
25	2096 KRL-82982-PR T174-5	10/6/88	77.36	12.68	0.92	0.01	0.04	0.50	0.06	3.74	4.69	100.00	0.9751

SAMPLE ID: SS-91-1-6B

Date of Analysis: 08/17/92

Raw Probe Data

Raw Probe Data
(FeO to Fe2O3)

Recalculated to 100%

SiO2	74.852	SiO2	76.58
Al2O3	12.713	Al2O3	13.01
FeO	0.943*1.1113=Fe2O3	Fe2O3	1.07
MgO	0.027	MgO	0.03
MnO	0.048	MnO	0.05
CaO	0.526	CaO	0.54
TiO2	0.058	TiO2	0.06
Na2O	3.823	Na2O	3.91
K2O	4.649	K2O	4.76

TOTAL (O) 97.640

TOTAL (N) 97.746

TOTAL (R) 100.01

Listing of 50 closest matches for COMP. NO. 2980 for elements: Si, Al, Fe, Ca, K, Mn, Mg, Ti, Na, K2O, Total, R, Sim. Co
C.No Sample Number

C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	CaO	TiO2	Na2O	K2O	Total, R	Sim. Co
1	2980 SS-91-1-6B	08/17/92	76.58	13.01	1.07	0.03	0.05	0.54	0.06	3.91	4.76	100.01
2	3009 SS-91-1-8C	08/21/92	76.68	12.93	1.08	0.01	0.05	0.54	0.06	3.90	4.75	100.00
3	2537 SS-91-1-1 T232-2	6/8/91	76.57	12.92	1.07	0.02	0.04	0.54	0.06	4.05	4.72	99.99
4	682 KSL-91882A, T66-11	10/28/83	76.91	12.76	1.07	0.03	0.06	0.54	0.07	3.87	4.60	99.99
5	2538 JB-B9-5 T227-2	4/13/91	76.69	12.91	1.08	0.02	0.05	0.55	0.09	3.90	4.70	99.99
6	2236 SL-113.5 T186-3	2/28/89	76.76	12.91	1.07	0.03	0.04	0.55	0.06	3.84	4.73	99.99
7	2520 JB-B9-7 T227-4	6/13/91	76.73	12.89	1.10	0.03	0.05	0.54	0.06	3.91	4.69	100.00
8	2961 SS-91-1-7A	08/17/92	76.64	12.93	1.06	0.02	0.05	0.55	0.06	3.96	4.73	100.00
9	562 KSL82282A(P), T66-6	xx/xx/83	76.86	12.85	1.05	0.03	0.06	0.54	0.05	3.87	4.70	100.01
10	2558 SS-91-1-SU T232-1	8/6/91	76.74	12.86	1.09	0.04	0.04	0.54	0.05	3.95	4.68	99.99
11	2493 FLV-156-S9 T219-3	12/20/90	76.64	13.06	1.09	0.03	0.04	0.54	0.05	3.94	4.62	100.01
12	681 KSL-91882A, T66-8	10/25/83	76.79	12.83	1.10	0.03	0.06	0.54	0.07	3.91	4.67	100.00
13	570 KSL91882D, T66-10	xx/xx/83	76.81	12.89	1.08	0.03	0.05	0.53	0.06	3.90	4.65	100.00
14	1680 KSL 860922 A T134-2	11/25/86	76.94	12.75	1.07	0.03	0.04	0.55	0.06	3.91	4.65	100.00
15	1186 WALKER LAKE CORE G 380CM T89-1	2/28/85	76.98	12.79	1.08	0.02	0.05	0.54	0.05	3.86	4.64	100.01
16	1224 WL CORE G 370CM T92-7	5/22/85	76.83	12.92	1.09	0.04	0.04	0.54	0.05	3.95	4.65	100.01
17	1025 KSL-71082C (S90) T58-1	6/22/84	76.91	12.71	1.08	0.02	0.00	0.53	0.05	3.95	4.74	99.99
18	2820 JB-B9-1 T226-6	6/24/92	76.70	12.80	1.06	0.02	0.04	0.54	0.06	4.05	4.72	99.99
19	1948 WL-4-4 (12.25M) T162-2	5/14/88	76.07	12.86	1.09	0.02	0.05	0.54	0.06	3.80	4.72	100.01
20	3010 SS-91-1-8D	08/21/92	76.56	12.99	1.12	0.02	0.05	0.55	0.06	3.89	4.77	100.01
21	2235 SL-103 T186-2	2/28/89	76.68	12.95	1.10	0.03	0.04	0.55	0.07	3.88	4.69	99.99
22	2563 SS-91-1-Adgss	8/7/91	76.73	12.85	1.04	0.03	0.05	0.53	0.07	3.95	4.74	99.99
23	2974 SS-91-4-Sua	08/17/92	76.60	12.86	1.10	0.02	0.05	0.54	0.06	4.04	4.74	100.01
24	760 BO-16	11/19/90	76.59	12.92	1.11	0.03	0.05	0.54	0.07	4.00	4.71	100.00
25	2487 FLV-149-C9 T218-8	11/19/90	76.77	13.05	1.07	0.03	0.05	0.53	0.06	3.81	4.63	100.00

Plot calcium vs iron for sample SS-91-1-7

SAMPLE ID: SS-91-1-7A

Date of Analysis: 08/17/92

Raw Probe Data
Raw Probe Data
(FeO to Fe2O3)

Recalculated to 100%

SiO2	75.111	SiO2	76.64
Al2O3	12.672	Al2O3	12.93
FeO	0.934	Fe2O3	1.06
MgO	0.023	MgO	0.02
MnO	0.047	MnO	0.05
CaO	0.535	CaO	0.55
TiO2	0.062	TiO2	0.06
Na2O	3.882	Na2O	3.96
K2O	4.633	K2O	4.73

TOTAL(O) 97.900 TOTAL(N) 97.004 TOTAL(R) 100.00

Listing of 50 closest matches for COMD. NO. 2961 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 08/21/92
C.No Sample Number Date SiO2 Al2O3 Fe2O3 MgO MnO CaO TiO2 Na2O K2O Total R Sim. Co

1	2961	SS-91-1-7A	08/17/92	76.64	12.93	1.06	0.02	0.05	0.55	0.06	3.96	4.73	100.00	1.0000
2	2567	JB-B8-4 T227-1	6/13/91	76.75	12.83	1.04	0.03	0.06	0.55	0.06	3.95	4.73	100.00	0.9949
3	2568	JB-B8-5 T227-2	6/13/91	76.69	12.91	1.08	0.02	0.05	0.55	0.09	3.90	4.70	99.99	0.9930
4	2236	SL-113-5 T186-3	2/28/89	76.76	12.91	1.07	0.03	0.04	0.55	0.06	3.94	4.73	99.99	0.9929
5	1806	OO-WL-65CM T143-7	6/24/87	76.81	12.00	1.03	0.01	0.05	0.56	0.05	3.96	4.70	100.01	0.9923
6	1418	HL-R3A-4 T112-9	10/23/85	76.83	12.79	1.08	0.04	0.04	0.55	0.06	3.96	4.65	100.00	0.9919
7	2820	JB-B8-1 T226-6	6/24/92	76.70	12.80	1.06	0.02	0.04	0.54	0.06	4.05	4.72	99.99	0.9911
8	2980	SS-91-1-6B	08/17/92	76.58	13.01	1.07	0.03	0.05	0.54	0.06	3.91	4.76	100.01	0.9911
9	2557	SS-91-1-1 T232-2	6/8/91	76.57	12.92	1.07	0.02	0.04	0.54	0.06	4.05	4.72	99.99	0.9911
10	3009	SS-91-1-8C	08/21/92	76.68	12.93	1.08	0.01	0.05	0.54	0.06	3.90	4.75	100.00	0.9906
11	1680	KFL 660922 A T134-2	11/25/86	76.94	12.75	1.07	0.03	0.04	0.55	0.06	3.91	4.65	100.00	0.9905
12	2795	FLV-209-BC T254-6	4/14/92	76.36	13.11	1.09	0.03	0.06	0.55	0.07	4.01	4.73	100.01	0.9904
13	1225	WL CORE G 380cm T92-8	5/2/85	76.82	12.79	1.06	0.04	0.04	0.56	0.06	4.00	4.65	100.02	0.9903
14	1034	WL 2-2-2.64, T78-7	08/18/84	77.06	12.62	1.06	0.03	0.05	0.55	0.06	3.86	4.71	100.00	0.9902
15	1112	WL 2-3-2.14M T85-2	12/4/84	76.97	12.69	1.06	0.03	0.04	0.56	0.06	3.96	4.63	100.01	0.9897
16	1310	WL 8-2B 172-174.5CM T99-10	7/1/85	76.90	12.74	1.05	0.02	0.05	0.56	0.07	3.91	4.71	100.01	0.9896
17	3005	SS-91-3-2B	08/17/92	76.45	12.92	1.05	0.01	0.04	0.55	0.07	4.15	4.76	100.00	0.9892
18	2558	SS-91-1-9U T232-1	8/6/91	76.74	12.86	1.09	0.04	0.04	0.54	0.05	3.95	4.68	99.99	0.9891
19	562	KFL82282A(P), T66-6	xx/xx/83	76.86	12.85	1.05	0.03	0.04	0.54	0.05	3.97	4.70	100.01	0.9890
20	2235	SL-103 T186-2	2/28/89	76.68	12.95	1.10	0.03	0.04	0.55	0.07	3.98	4.69	99.99	0.9888
21	2563	SS-91-1-Adgase	8/7/91	76.73	12.85	1.04	0.03	0.05	0.53	0.07	3.95	4.74	99.99	0.9888
22	2718	FLV-202-D T249-6	1/30/92	76.79	12.79	1.06	0.02	0.04	0.58	0.07	3.96	4.68	99.99	0.9875
23	1224	WL CORE G 370cm T92-7	5/2/85	76.83	12.82	1.09	0.04	0.04	0.54	0.05	3.95	4.65	100.01	0.9873
24	682	KFL-91882G, T66-11	10/25/83	76.91	12.76	1.07	0.03	0.04	0.54	0.07	3.97	4.68	99.99	0.9871
25	1036	WL 2-3-2.01, T78-9	08/18/84	77.05	12.74	1.05	0.02	0.04	0.55	0.05	3.92	4.67	99.99	0.9871

SAMPLE ID: SS-91-1-7B
 Date of Analysis: 08/17/92

Recalculated to 100%

Raw Probe Data
 (FeO to Fe2O3)

SiO2	72.696	SiO2	76.66
Al2O3	12.351	Al2O3	13.02
FeO	0.829*1.1113=Fe2O3	Fe2O3	0.97
MgO	0.008	MgO	0.01
MnO	0.055	MnO	0.06
CaO	0.467	CaO	0.49
TiO2	0.062	TiO2	0.07
Na2O	3.752	Na2O	3.96
K2O	4.518	K2O	4.76

TOTAL (R) 100.00

TOTAL (N) 94.828

TOTAL (O) 94.736

Listing of 50 closest matches for COMP. NO. 2981 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 08/21/92
 C.No Sample Number Date SiO2 Al2O3 Fe2O3 MgO MnO CaO TiO2 Na2O K2O Total.R Sim. Co

1	2981	SS-91-1-7B	08/17/92	76.66	13.02	0.97	0.01	0.06	0.49	0.07	3.96	4.76	100.00	1.0000
2	2802	FLV-165-CH T255-5	4/15/92	76.64	13.03	0.92	0.02	0.06	0.49	0.08	4.04	4.72	100.00	0.9865
3	3008	SS-91-1-8B	08/21/92	76.71	12.96	0.99	0.02	0.06	0.52	0.06	3.93	4.75	99.99	0.9862
4	2959	SS-91-1-5A	08/17/92	76.66	13.08	0.97	0.02	0.05	0.51	0.04	4.03	4.64	100.00	0.9856
5	2972	SS-91-4-4E	08/17/92	77.05	12.74	0.98	0.03	0.03	0.49	0.03	4.07	4.50	100.00	0.9831
6	2494	FLV-157-S5 T219-4	12/20/90	77.01	12.87	0.93	0.03	0.05	0.49	0.05	4.02	4.55	100.00	0.9806
7	623	TULELAKE-296(200-325), T62-5	08/25/83	76.54	13.06	1.06	0.06	0.05	0.48	0.09	3.93	4.74	100.01	0.9797
8	2167	KSL-82982-J T178-3	12/6/88	76.86	13.03	0.96	0.02	0.05	0.52	0.05	3.79	4.72	100.00	0.9795
9	2820	SS-91-1-6A	08/17/92	76.66	13.06	0.93	0.02	0.05	0.52	0.06	3.90	4.79	99.99	0.9791
10	2237	SS-262.5 T136-4	2/28/89	76.96	12.94	0.96	0.03	0.04	0.52	0.06	3.87	4.62	100.00	0.9783
11	2978	SS-91-1-4A	08/17/92	76.38	13.14	1.02	0.03	0.04	0.51	0.06	4.08	4.74	100.00	0.9776
12	1470	BL-RSA-6 T112-11	10/23/85	77.08	12.78	0.97	0.02	0.04	0.53	0.04	3.97	4.56	99.99	0.9760
13	2030	KSL-82882-K T168-15	7/20/88	77.14	12.53	0.94	0.03	0.05	0.52	0.05	4.00	4.73	99.99	0.9752
14	762	BO-19		76.82	13.02	1.00	0.02	0.03	0.53	0.06	3.91	4.61	100.00	0.9747
15	2194	FLV-107-TC T182-3	1/24/89	76.81	13.14	0.92	0.03	0.02	0.51	0.06	3.86	4.64	99.99	0.9746
16	2029	KSL-82882-L T169-14	7/20/88	77.12	12.53	0.95	0.02	0.04	0.53	0.05	3.98	4.68	100.00	0.9744
17	1309	WL 8-7 T91-12	3/1/85	77.42	12.57	0.96	0.02	0.05	0.51	0.04	3.93	4.51	100.01	0.9743
18	2989	SS-91-4-3B	08/17/92	77.09	12.63	0.97	0.02	0.03	0.52	0.05	4.08	4.61	100.00	0.9743
19	2052	KSL-82882-M T174-2	10/6/88	77.27	12.68	0.97	0.02	0.04	0.52	0.05	3.82	4.63	100.00	0.9743
20	2975	SS-91-1-1A	08/17/92	76.75	12.90	0.90	0.03	0.07	0.51	0.05	4.07	4.73	100.01	0.9742
21	2099	CSAW-88-3C (HI Fe,Ca) T173-2	10/6/88	76.63	12.99	0.95	0.06	0.04	0.52	0.10	3.76	4.94	100.00	0.9737
22	2174	KSL-82982-O (MIN-1) T178-9	12/6/88	76.72	13.16	0.97	0.02	0.00	0.55	0.02	3.97	4.59	100.00	0.9735
23	1231	WL 8-7 62-64.5cm T92-15	5/1/85	77.25	12.78	0.98	0.03	0.05	0.51	0.05	3.76	4.59	100.00	0.9730
24	2719	FLV-207-LC T252-6	3/10/92	77.22	12.60	1.01	0.01	0.05	0.51	0.06	3.95	4.56	99.97	0.9729
25	2563	SS-91-1-Adgso	8/7/91	76.73	12.95	1.04	0.03	0.05	0.53	0.07	3.95	4.74	99.99	0.9728

plot calcium vs iron for sample SS-91-1-8

Date of Analysis: 08/17/92

SAMPLE ID: SS-91-1-8B

Recalculated to 100%

Raw Probe Data
(FeO to Fe2O3)

SiO2	74.392	SiO2	76.98
Al2O3	12.591	Al2O3	13.03
FeO	0.861*1.1113=Fe2O3	Fe2O3	0.99
MgO	0.024	MgO	0.03
MnO	0.056	MnO	0.06
CaO	0.513	CaO	0.53
TiO2	0.052	TiO2	0.05
Na2O	3.794	Na2O	3.93
K2O	4.611	K2O	4.77

TOTAL (R) 100.37

TOTAL (O) 96.544

TOTAL (N) 96.640

Listing of 50 closest matches for COMP. NO. 3008 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 08/21/92
C.No Sample Number

C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total	R	Sim.	Co
1	3008 SS-91-1-8B	08/21/92	76.71	12.96	0.98	0.02	0.06	0.52	0.06	3.93	4.75	99.99	1.0000		
2	2237 BL-262-5 T186-4	2/28/89	76.96	12.94	0.96	0.03	0.04	0.52	0.06	3.87	4.62	100.00	0.9887		
3	2187 KSL-82982-J T178-3	12/6/88	76.86	13.03	0.96	0.02	0.05	0.52	0.05	3.79	4.72	100.00	0.9884		
4	2970 SS-91-1-6A	08/17/92	76.66	13.06	0.93	0.02	0.05	0.52	0.06	3.90	4.76	99.99	0.9871		
5	762 MO-19		76.02	13.02	1.00	0.02	0.03	0.53	0.06	3.91	4.61	100.00	0.9861		
6	2981 SS-91-1-7B	08/17/92	76.66	13.02	0.97	0.01	0.06	0.49	0.07	3.96	4.76	100.00	0.9862		
7	2959 SS-91-1-5A	08/17/92	76.66	13.08	0.97	0.02	0.05	0.51	0.04	4.03	4.64	100.00	0.9855		
8	2093 KSL-82982-M T174-2	10/6/88	77.27	12.68	0.97	0.02	0.04	0.52	0.05	3.82	4.63	100.00	0.9846		
9	2563 SS-91-1-Adgas	8/7/91	76.73	12.85	1.04	0.03	0.05	0.53	0.07	3.95	4.74	99.99	0.9842		
10	569 KSL91982A, T66-9	xx/xx/83	76.70	12.95	1.01	0.03	0.06	0.53	0.06	3.83	4.84	100.01	0.9844		
11	1420 BL-RSA-6, T112-11	10/23/85	77.08	12.78	0.97	0.02	0.04	0.53	0.04	3.97	4.56	99.99	0.9837		
12	3004 SS-91-3-2A	08/17/92	76.85	12.76	1.00	0.01	0.04	0.53	0.05	4.06	4.70	100.00	0.9836		
13	2030 KSL-82982-K T160-15	7/20/88	77.14	12.53	0.94	0.03	0.05	0.52	0.05	4.00	4.73	99.99	0.9831		
14	2098 KSL-82982-S T174-7	10/6/88	77.25	12.70	0.96	0.02	0.04	0.52	0.06	3.73	4.73	100.01	0.9829		
15	2099 CRAN-88-3G (HI Fe,Ca) T173-2	10/6/88	76.53	12.99	0.96	0.06	0.04	0.52	0.10	3.76	4.94	100.00	0.9824		
16	2168 KSL-82982-KO T178-4	12/6/88	76.79	13.03	1.00	0.02	0.06	0.54	0.06	3.81	4.69	100.00	0.9822		
17	2989 SS-91-4-3B	08/17/92	77.09	12.63	0.97	0.02	0.03	0.52	0.05	3.98	4.61	100.00	0.9821		
18	2029 KSL-82982-I T160-14	7/20/88	77.12	12.63	0.95	0.02	0.04	0.53	0.05	4.08	4.68	100.00	0.9808		
19	2978 SS-91-1-4A	08/17/92	76.38	13.14	1.02	0.03	0.04	0.51	0.06	4.08	4.74	100.00	0.9806		
20	1423 BL-RSA-9 T112-14	10/23/85	77.13	12.80	1.02	0.03	0.05	0.52	0.04	3.87	4.54	99.98	0.9805		
21	1231 WL 8-7 62-64.5cm T92-15	5/1/85	77.25	12.78	0.98	0.03	0.05	0.51	0.05	3.76	4.59	100.00	0.9804		
22	2171 KSL-82982-M T178-7	12/6/88	77.04	12.92	0.91	0.00	0.05	0.52	0.05	3.82	4.70	100.01	0.9799		
23	1421 BL-RSA-7 T112-12	10/23/85	77.16	12.66	1.03	0.04	0.05	0.52	0.03	3.95	4.57	100.01	0.9799		
24	559 KSL82192 (bubble wall), T56-4	07/01/83	76.87	12.92	1.01	0.02	0.03	0.53	0.03	4.03	4.55	99.99	0.9799		
25	3002 SS-91-4-2A	08/17/91	77.10	12.61	0.95	0.02	0.02	0.52	0.03	4.09	4.66	100.00	0.9799		

SAMPLE ID: SS-91-1-8C			Date of Analysis: 08/21/92		
Raw Probe Data			Recalculated to 100%		
Raw Probe Data			Raw Probe Data		
(FeO to Fe2O3)			(FeO to Fe2O3)		
SiO2	0.074		SiO2	7.78	
Al2O3	12.647		Al2O3	1328.84	
FeO	0.045*1.1113=Fe2O3	0.050	Fe2O3	5.25	
MgO	0.013		MgO	1.39	
MnO	0.058		MnO	6.12	
CaO	4.648		CaO	488.36	
TiO2	0.525		TiO2	55.16	
Na2O	3.818		Na2O	401.19	
K2O	0.997		K2O	104.76	
TOTAL(O)	0.946	TOTAL(N)	0.952	TOTAL(R)	2398.85

Listing of 50 closest matches for COMP. NO. 3009 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 08/21/92													
C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total, R	Sim. Co
1	3009 SS-91-1-8C	08/21/92	76.68	12.93	1.08	0.01	0.05	0.54	0.06	3.90	4.75	100.00	1.0000
2	2980 SS-91-1-6B	08/17/92	76.58	13.01	1.07	0.03	0.05	0.54	0.06	3.91	4.76	100.01	0.9964
3	2568 JB-B8-5 T227-2	6/13/91	76.69	12.91	1.08	0.02	0.05	0.55	0.09	3.90	4.70	99.99	0.9949
4	2570 JB-B8-7 T227-4	6/13/91	76.73	12.89	1.10	0.03	0.05	0.54	0.06	3.91	4.69	100.00	0.9930
5	2550 SS-91-1-SU T232-1	9/6/91	76.74	12.86	1.09	0.04	0.04	0.54	0.05	3.95	4.68	99.99	0.9929
6	570 KSL91882D, T66-10	xx/xx/83	76.81	12.89	1.08	0.03	0.05	0.53	0.06	3.90	4.65	100.00	0.9926
7	681 KSL-91882A, T66-9	10/25/83	76.79	12.83	1.10	0.03	0.06	0.54	0.07	3.91	4.67	100.00	0.9927
8	482 KSL-91882G, T66-11	10/25/83	76.91	12.76	1.07	0.03	0.06	0.54	0.07	3.87	4.68	99.99	0.9920
9	1186 WILVER LAKE CORE G 380CM T89-1	5/14/88	76.98	12.79	1.08	0.02	0.05	0.54	0.06	3.86	4.64	100.01	0.9920
10	1948 WL-4-4 (12.25M) T162-2	2/28/85	76.97	12.86	1.09	0.02	0.05	0.54	0.06	3.80	4.72	100.01	0.9918
11	2236 SL-115.5 T186-3	2/28/89	76.76	12.91	1.07	0.03	0.04	0.55	0.06	3.84	4.73	99.99	0.9917
12	1025 KSL-71082C (S90) T58-1	6/22/84	76.91	12.71	1.08	0.02	0.00	0.53	0.05	3.95	4.74	99.99	0.9911
13	1224 WL CORE G 370cm T92-7	5/2/85	76.83	12.82	1.09	0.04	0.04	0.54	0.05	3.95	4.65	100.01	0.9911
14	562 KSL82282A(P), T66-6	xx/xx/83	76.86	12.85	1.05	0.03	0.06	0.54	0.05	3.87	4.70	100.01	0.9909
15	2557 SS-91-1-1 T232-2	6/8/91	76.57	12.92	1.07	0.02	0.04	0.54	0.06	4.05	4.72	99.99	0.9909
16	2235 SL-103 T186-2	2/28/89	76.68	12.95	1.10	0.03	0.04	0.55	0.07	3.88	4.69	99.99	0.9907
17	2961 SS-91-1-7A	08/17/92	76.64	12.93	1.06	0.02	0.05	0.55	0.06	3.96	4.73	100.00	0.9905
18	2493 FLV-156-SS T219-3	12/20/90	76.64	13.06	1.09	0.03	0.04	0.54	0.05	3.94	4.62	100.01	0.9905
19	1416 BL-R3A-2 T112-7	10/23/85	76.78	12.85	1.12	0.04	0.03	0.54	0.06	3.90	4.68	100.00	0.9903
20	680 KSL-82282B, T54-4	xx//xx/83	76.99	12.71	1.08	0.02	0.06	0.53	0.04	3.86	4.70	99.99	0.9899
21	2974 SS-91-4-SUA	08/17/92	76.60	12.86	1.10	0.02	0.05	0.54	0.06	4.04	4.74	100.01	0.9898
22	566 KSL91882B, T64-12	09/06/83	76.81	12.82	1.10	0.01	0.05	0.53	0.08	3.91	4.69	100.00	0.9897
23	760 BO-16	3/6/96	76.59	12.92	1.11	0.03	0.03	0.54	0.07	4.00	4.71	100.00	0.9896
24	1472 KSL 82182 (A-1) T117-3	12/20/90	76.80	12.75	1.10	0.03	0.04	0.55	0.07	3.87	4.77	99.98	0.9894
25	2496 FLV-159-CH T219-6	12/20/90	77.01	12.76	1.08	0.03	0.03	0.54	0.05	3.94	4.57	100.01	0.9891

SAMPLE ID: SS-91-1-8D

Date of Analysis: 08/21/92

Recalculated to 100%

Raw Probe Data
(FeO to Fe2O3)

SiO2	75.368	SiO2	76.56
Al2O3	12.783	Al2O3	12.99
FeO	0.990*1.1113=Fe2O3	Fe2O3	1.12
MgO	0.022	MgO	0.02
MnO	0.049	MnO	0.05
CaO	0.539	CaO	0.55
TiO2	0.059	TiO2	0.06
Na2O	3.825	Na2O	3.83
K2O	4.695	K2O	4.77

TOTAL(O) 98.329 TOTAL(N) 98.439 TOTAL(P) 100.01

Listing of 50 closest matches for COMP. NO. 3010 for elements: Na, Al, Si, Fe Date of Update: 08/21/92

C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	CaO	TiO2	Na2O	K2O	Total, R	Sim. Co
1	3010 SS-91-1-8D	08/21/92	76.56	12.99	1.12	0.02	0.05	0.55	0.06	3.89	4.77	100.01
2	2235 SL-103 T186-2	2/28/89	76.68	12.95	1.10	0.03	0.04	0.53	0.07	3.88	4.69	99.99
3	1472 KRL 82182 (A-1) T117-3	3/6/86	76.80	12.75	1.10	0.03	0.04	0.53	0.07	3.87	4.77	99.98
4	783 GS-27	10/23/85	76.74	12.92	1.12	0.03	0.05	0.54	0.06	3.91	4.61	100.00
5	1416 BL-RSA-2 T112-7	12/6/88	76.70	13.01	1.11	0.02	0.06	0.55	0.06	3.90	4.60	100.00
6	2169 KRL-82282-KD T178-5	5/2/85	76.69	12.91	1.14	0.04	0.04	0.55	0.06	3.92	4.67	99.99
7	1241 WL 4-2 3.31m T93-10	xx/xx/83	76.74	12.90	1.13	0.02	0.06	0.54	0.06	3.87	4.68	100.00
8	758 BO-11	6/13/91	76.69	12.91	1.08	0.02	0.05	0.55	0.09	3.90	4.70	99.99
9	560 KRL82282, T66-4	08/21/92	76.68	12.93	1.10	0.03	0.05	0.54	0.06	3.91	4.75	100.00
10	2568 JB-B9-5 T227-2	6/13/91	76.73	12.89	1.10	0.03	0.05	0.54	0.06	3.91	4.69	100.00
11	952 DR-64	6/13/91	76.79	12.72	1.13	0.03	0.05	0.54	0.05	3.91	4.83	100.00
12	3009 SS-91-1-8C	6/22/84	76.73	12.89	1.10	0.03	0.05	0.54	0.05	3.89	4.64	100.00
13	2570 JB-B9-7 T227-4	10/23/85	76.83	12.80	1.15	0.04	0.05	0.55	0.05	3.91	4.76	100.01
14	1029 KRL-99102K-1P (595) T58-6	08/17/92	76.58	13.01	1.07	0.03	0.05	0.54	0.06	3.91	4.71	100.00
15	1417 BL-RSA-3 T112-8	2/28/89	76.59	12.92	1.11	0.03	0.04	0.54	0.07	4.00	4.71	100.00
16	2980 SS-91-1-6B	4/16/92	76.58	13.11	1.09	0.03	0.06	0.55	0.07	4.01	4.73	100.01
17	760 BO-16	10/25/83	76.36	13.11	1.10	0.03	0.06	0.55	0.07	3.91	4.67	100.00
18	2236 SL-115.5 T186-3	3/1/85	76.54	12.89	1.15	0.07	0.04	0.57	0.14	3.89	4.72	100.01
19	788 GS-32	09/12/86	76.93	12.70	1.10	0.03	0.05	0.55	0.07	3.83	4.68	99.99
20	2795 FLV-209-BC T254-6	5/16/88	76.93	12.81	1.13	0.03	0.05	0.55	0.05	3.79	4.64	99.98
21	681 KRL-91892A', T66-8	08/12/92	76.59	12.83	1.19	0.02	0.05	0.55	0.11	3.92	4.75	100.01
22	1191 TULLAKE 2038 (53.67M) T90-6											
23	1621 BO-18 JOD											
24	1949 WL-4-4B (12.00M) T162-3											
25	2866 SS-91-1-7(38)											

Plot calcium vs iron for sample SS-91-2-Su

SAMPLE ID: SS-91-2SUA

Date of Analysis: 08/17/92

Recalculated to 100%

Raw Probe Data
(FeO to Fe2O3)

Raw Probe Data

SiO2	73.673	SiO2	76.73
Al2O3	12.135	Al2O3	12.64
FeO	0.891*1.1113=Fe2O3	Fe2O3	1.03
MgO	0.027	MgO	0.03
MnO	0.038	MnO	0.04
CaO	0.514	CaO	0.54
TiO2	0.055	TiO2	0.06
Na2O	4.138	Na2O	4.31
K2O	4.450	K2O	4.63

TOTAL (O)	95.921	TOTAL (N)	96.020	TOTAL (R)	100.01
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Listing of 50 closest matches for COMP. NO. 2955 for elame e: Na, Al, Si, K, Ca, Fe Date of Update: 08/21/92												
C.No	Sample Number	Date	SiO2	Al2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total, R	Sim. Co
1	2955 SS-91-290A	08/17/92	76.73	12.64	1.03	0.03	0.04	0.06	4.31	4.63	100.01	1.0000
2	2643 JB-B9-16 T241-7	10/21/91	76.97	12.59	1.04	0.02	0.08	0.54	4.13	4.58	100.00	0.9885
3	2984 SS-91-3-1B	08/17/92	76.95	12.54	1.00	0.02	0.04	0.05	4.31	4.56	100.01	0.9877
4	2642 JB-B9-15 T241-6	10/21/91	76.59	12.83	1.08	0.03	0.07	0.54	4.23	4.59	100.00	0.9850
5	2762 FLV-208B-LC T250-6	2/26/92	76.84	12.64	0.98	0.02	0.04	0.04	4.29	4.63	100.00	0.9847
6	2707 FLV-192-BC T246-1	12/12/91	77.01	12.55	1.05	0.03	0.05	0.05	4.18	4.56	100.01	0.9844
7	2994 SS-91-1-2B	08/17/92	76.51	12.97	1.04	0.03	0.06	0.54	4.12	4.69	100.02	0.9842
8	2640 JB-B9-13 T241-4	10/21/91	76.49	12.83	1.08	0.03	0.08	0.53	4.26	4.64	100.00	0.9839
9	2968 SS-91-3-SuA	08/17/92	76.56	12.75	1.02	0.02	0.05	0.04	4.41	4.63	99.99	0.9835
10	2963 SS-91-2-1B	08/17/92	76.57	12.72	1.05	0.02	0.03	0.51	4.34	4.60	100.01	0.9832
11	2965 SS-91-2-SuB	08/17/92	76.62	12.69	1.09	0.04	0.05	0.52	4.31	4.61	100.01	0.9830
12	435 3-30-82-1, T43-3	08/17/92	76.62	12.93	1.06	0.02	0.05	0.54	4.07	4.13	4.59	0.9829
13	2964 SS-91-2-3C	08/17/92	76.76	12.67	1.10	0.01	0.04	0.53	4.26	4.63	100.00	0.9828
14	2953 SS-91-2-1A	08/17/92	76.61	12.67	1.07	0.01	0.04	0.57	4.37	4.63	100.00	0.9821
15	2998 SS-91-3-1C	08/17/92	77.17	12.30	1.07	0.03	0.06	0.54	4.23	4.54	99.99	0.9820
16	2956 SS-91-3-1D	08/17/92	76.60	12.69	1.09	0.03	0.04	0.52	4.32	4.66	99.99	0.9819
17	3006 SS-91-4-2B	08/17/92	76.94	12.60	1.03	0.04	0.04	0.51	4.04	4.13	4.66	0.9814
18	2559 SS-91-1-2 T232-3	8/7/91	77.11	12.63	1.03	0.03	0.05	0.54	3.89	4.67	100.01	0.9814
19	3003 SS-91-4-4C	08/17/92	77.01	12.67	1.02	0.03	0.03	0.52	4.08	4.59	100.00	0.9809
20	2987 SS-91-3-SuB	08/17/92	76.51	12.77	1.10	0.03	0.04	0.53	4.37	4.60	100.00	0.9808
21	2990 SS-91-4-4B	08/17/92	77.12	12.63	0.98	0.02	0.03	0.53	4.02	4.09	4.57	0.9803
22	2645 JB-HA-1 T242-1	10/21/91	76.77	12.70	1.09	0.02	0.07	0.54	4.19	4.57	100.00	0.9801
23	2820 JB-B9-1 T226-6	6/24/92	76.70	12.80	1.06	0.02	0.04	0.54	4.05	4.72	99.99	0.9799
24	2561 SS-91-1-4 T233-5	8/7/91	77.02	12.63	1.06	0.02	0.04	0.53	4.00	4.63	99.99	0.9794
25	2638 JB-B9-11 T241-2	10/21/91	76.55	12.80	1.10	0.02	0.08	0.54	4.16	4.68	99.99	0.9793
26	3005 SS-91-3-2B	08/17/92	76.45	12.92	1.05	0.01	0.04	0.55	4.07	4.15	4.76	0.9788
27	2973 SS-91-4-5B	08/17/92	76.92	12.75	1.06	0.04	0.04	0.53	4.04	4.50	100.03	0.9785
28	2562 SS-91-1-5 T232-6	8/7/91	76.97	12.65	1.08	0.03	0.04	0.54	3.90	4.65	100.01	0.9782
29	3004 SS-91-3-2A	08/17/92	76.85	12.76	1.00	0.01	0.04	0.53	4.06	4.70	100.00	0.9781
30	2637 JB-B9-9 T241-1	10/21/91	76.42	12.92	1.10	0.01	0.08	0.55	4.22	4.65	100.00	0.9779
31	679 FRL-82182(A-4), T66-3	10/25/83	76.89	12.82	1.02	0.05	0.05	0.52	4.20	4.55	99.99	0.9777
32	2641 JB-B9-14 T241-5	10/21/91	76.55	12.82	1.11	0.02	0.05	0.06	4.20	4.62	100.00	0.9776
33	2639 JB-B9-12 T241-3	10/21/91	76.51	12.85	1.11	0.03	0.08	0.54	4.16	4.67	100.00	0.9776
34	1141 WL-2-3-1.94M T85-1	12/4/84	76.97	12.65	1.05	0.03	0.05	0.56	4.00	4.66	100.02	0.9772
35	554 FRL82182(A-3), T56-4	07/01/83	76.97	12.82	1.02	0.01	0.05	0.04	4.02	4.44	99.99	0.9771
36	2982 SS-91-2-1C	08/17/92	76.50	12.67	1.11	0.03	0.05	0.52	4.36	4.69	100.00	0.9769
37	2761 FLV-208A-LC T250-5	2/26/92	76.75	12.77	0.97	0.02	0.04	0.51	4.33	4.58	100.01	0.9767
38	2557 SS-91-1-1 T232-2	6/8/91	76.57	12.92	1.07	0.02	0.04	0.54	4.05	4.72	99.99	0.9766
39	1421 BL-RSA-7 T112-12	10/23/85	77.16	12.66	1.03	0.04	0.05	0.52	3.95	4.57	100.01	0.9766
40	559 FRL82182(bubble wall), T56-4	07/01/83	76.87	12.92	1.01	0.02	0.03	0.53	4.03	4.55	99.99	0.9761
41	2560 SS-91-1-3 T232-4	8/7/91	77.08	12.64	1.06	0.02	0.05	0.06	3.92	4.64	100.00	0.9760
42	2977 SS-91-1-3A	08/17/92	76.67	12.62	1.08	0.03	0.05	0.56	4.17	4.77	100.00	0.9756
43	2567 JB-B9-4 T227-1	6/13/91	76.75	12.83	1.04	0.06	0.05	0.55	3.95	4.73	100.00	0.9754
44	2995 SS-91-1-3B	08/17/92	76.71	12.69	1.09	0.02	0.05	0.52	4.17	4.72	100.01	0.9754
45	2969 SS-91-4-2C	08/17/92	76.97	12.56	1.08	0.02	0.02	0.56	4.08	4.65	99.98	0.9751
46	2563 SS-91-1-Adges	8/7/91	76.73	12.85	1.04	0.03	0.05	0.53	3.95	4.74	99.99	0.9748
47	3000 SS-91-3-SuC	08/17/92	76.36	12.79	1.17	0.03	0.05	0.54	4.34	4.67	100.00	0.9747
48	1142 WL-2-3-2.14M T85-2	12/4/84	76.97	12.69	1.06	0.03	0.05	0.56	3.96	4.63	100.01	0.9746

Date of Analysis: 08/17/92

SAMPLE ID: SS-91-2-SUB

Raw Probe Data
 Recalculated to 100%

Raw Probe Data
 (FeO to Fe2O3)

Listing of 50 closest matches for COMP. NO. 2965 for elements. Na, Al, Si, K, Ca, Fe												Date of Update: 08/21/92		K2O Total, R Sim. Co	
C.No Sample Number		Date	SiO2	Al2O3	Fe2O3	MgO	CaO	TiO2	Na2O	K2O	Total, R	Sim. Co			

1	2965 SS-91-2-SuB	08/17/92	76.62	12.69	1.09	0.04	0.05	0.52	4.31	4.61	100.01	1.0000			
2	2956 SS-91-3-1D	08/17/92	76.60	12.69	1.09	0.03	0.04	0.52	4.32	4.67	100.01	0.9974			
3	2964 SS-91-2-3C	08/17/92	76.76	12.67	1.10	0.01	0.04	0.53	4.26	4.60	100.01	0.9925			
4	2982 SS-91-2-1C	08/17/92	76.50	12.67	1.11	0.03	0.05	0.52	4.36	4.69	100.00	0.9917			
5	2987 SS-91-3-SuB	08/17/92	76.51	12.77	1.10	0.03	0.04	0.53	4.37	4.60	100.00	0.9914			
6	2995 SS-91-1-3B	08/17/92	76.71	12.69	1.09	0.02	0.05	0.52	4.17	4.72	100.01	0.9905			
7	2645 JB-WA-1 T242-1	10/21/91	76.77	12.70	1.09	0.02	0.07	0.53	4.19	4.57	100.00	0.9903			
8	2640 JB-B3-13 T241-4	10/21/91	76.49	12.83	1.08	0.03	0.08	0.53	4.26	4.59	100.00	0.9902			
9	2642 JB-B3-15 T241-6	10/21/91	76.59	12.93	1.08	0.03	0.07	0.54	4.23	4.54	100.00	0.9906			
10	2963 SS-91-2-1B	08/17/92	76.57	12.72	1.05	0.02	0.04	0.51	4.34	4.60	100.01	0.9865			
11	2873 SS-91-3-1(31)	08/17/92	76.79	12.66	1.15	0.01	0.04	0.52	4.25	4.54	100.00	0.9857			
12	2957 SS-91-4-4D	08/17/92	76.75	12.81	1.11	0.03	0.02	0.52	4.07	4.63	99.99	0.9848			
13	2967 SS-91-3-1E	08/17/92	76.86	12.51	1.16	0.01	0.05	0.53	4.26	4.59	99.99	0.9833			
14	2983 SS-91-2-SuC	08/17/92	76.52	12.74	1.16	0.02	0.04	0.54	4.31	4.63	100.01	0.9830			
15	2955 SS-91-2SDA	08/17/92	76.73	12.64	1.03	0.03	0.04	0.54	4.16	4.68	99.99	0.9824			
16	2638 JB-B3-11 T241-2	10/21/91	76.55	12.80	1.10	0.02	0.08	0.54	4.04	4.66	100.00	0.9816			
17	2979 SS-91-1-5B	08/17/92	76.42	13.14	1.09	0.03	0.05	0.52	4.04	4.66	100.00	0.9814			
18	2641 JB-B3-14 T241-5	10/21/91	76.55	12.82	1.11	0.02	0.07	0.55	4.20	4.62	100.00	0.9814			
19	2707 FLV-192-BC T246-1	12/12/91	77.01	12.55	1.05	0.03	0.05	0.53	4.10	4.56	100.01	0.9812			
20	2993 SS-91-1-1B	08/17/92	76.49	12.92	1.10	0.02	0.07	0.53	4.11	4.70	99.99	0.9812			
21	2874 SS-91-3-1(32)	08/12/92	76.78	12.56	1.17	0.03	0.04	0.51	4.28	4.58	100.00	0.9811			
22	2637 JB-B3-9 T241-1	10/21/91	76.42	12.92	1.10	0.01	0.08	0.55	4.22	4.65	100.00	0.9811			
23	2968 SS-91-3-SuA	08/17/92	76.56	12.75	1.02	0.02	0.05	0.51	4.41	4.63	99.99	0.9807			
24	2639 JB-B3-12 T241-3	10/21/91	76.51	12.85	1.11	0.03	0.08	0.54	4.16	4.67	100.00	0.9806			
25	2762 FLV-208B-LC T250-6	2/26/92	76.84	12.64	0.90	0.02	0.04	0.52	4.29	4.63	100.00	0.9806			
26	2973 SS-91-4-5B	08/17/92	76.92	12.75	1.06	0.04	0.04	0.53	4.05	4.58	100.03	0.9797			
27	684 KFL-92082D, T66-12	10/25/83	77.02	12.69	1.09	0.02	0.05	0.51	4.04	4.66	100.00	0.9791			
28	2953 SS-91-2-1A	08/17/92	76.61	12.67	1.07	0.01	0.04	0.57	4.37	4.63	100.00	0.9790			
29	2998 SS-91-3-1C	08/17/92	77.17	12.30	1.07	0.03	0.06	0.54	4.23	4.54	99.99	0.9787			
30	564 KPL82782A, T64-11	09/06/83	76.99	12.75	1.09	0.01	0.06	0.53	3.90	4.59	100.00	0.9787			
31	561 KPL82282A, T66-5	10/25/83	76.71	12.88	1.12	0.04	0.05	0.52	3.98	4.65	100.01	0.9787			

Plot calcium vs iron for sample SS-91-2-1

Date of Analysis: 08/17/92

SAMPLE ID: SS-91-2-1A

Recalculated to 100%

Raw Probe Data
(FeO to Fe2O3)

SiO2	74.413	SiO2	76.61
Al2O3	12.307	Al2O3	12.67
FeO	0.936*1.1113=Fe2O3	Fe2O3	1.07
MgO	0.007	MgO	0.01
MnO	0.041	MnO	0.04
CaO	0.555	CaO	0.57
TiO2	0.030	TiO2	0.03
Na2O	4.208	Na2O	4.33
K2O	4.498	K2O	4.63

TOTAL(R) 99.96

TOTAL(N) 97.131

TOTAL(O) 97.027

Listing of 50 closest matches for COMP. NO. 2953 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 08/21/92													
C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	CaO	TiO2	Na2O	K2O	Total, R	Sim. Co	
1	2953 SS-91-2-1A	08/17/92	76.61	12.67	1.07	0.01	0.04	0.57	0.03	4.37	4.63	100.00	1.0000
2	2977 SS-91-1-3A	08/17/92	76.67	12.62	1.08	0.03	0.05	0.56	0.05	4.17	4.77	100.00	0.9822
3	2955 SS-91-230A	08/17/92	76.73	12.64	1.03	0.03	0.04	0.54	0.06	4.31	4.63	100.01	0.9821
4	2969 SS-91-4-2C	08/17/92	76.97	12.56	1.08	0.02	0.02	0.56	0.04	4.04	4.65	99.98	0.9815
5	2987 SS-91-3-9uB	08/17/92	76.51	12.77	1.10	0.03	0.04	0.53	0.05	4.37	4.60	100.00	0.9812
6	2642 JB-B3-13 T241-6	10/21/91	76.59	12.83	1.08	0.03	0.07	0.54	0.04	4.23	4.59	100.00	0.9808
7	2640 JB-B3-13 T241-4	10/21/91	76.49	12.83	1.08	0.03	0.08	0.53	0.06	4.26	4.64	100.00	0.9799
8	2637 JB-B3-9 T241-1	10/21/91	76.42	12.92	1.10	0.01	0.08	0.55	0.05	4.22	4.65	100.00	0.9795
9	2641 JB-B3-14 T241-5	10/21/91	76.55	12.82	1.11	0.02	0.07	0.55	0.06	4.20	4.62	100.00	0.9792
10	2965 SS-91-2-9uB	08/17/92	76.62	12.69	1.09	0.04	0.05	0.52	0.08	4.31	4.61	100.01	0.9790
11	1142 WL-2-3-2.14M T85-2	12/4/84	76.97	12.69	1.06	0.03	0.05	0.56	0.06	3.96	4.63	100.01	0.9788
12	2956 SS-91-3-1D	08/17/92	76.60	12.69	1.09	0.03	0.04	0.52	0.05	4.32	4.67	100.01	0.9787
13	2682 JB-B3-9 T241-1	10/21/91	76.15	13.07	1.11	0.01	0.08	0.56	0.05	4.27	4.70	100.00	0.9787
14	1225 WL CORE G 380cm T92-8	5/2/85	76.82	12.79	1.06	0.04	0.04	0.56	0.06	4.00	4.65	100.02	0.9787
15	2964 SS-91-2-3C	08/17/92	76.76	12.67	1.10	0.01	0.04	0.53	0.04	4.26	4.60	100.01	0.9782
16	1141 WL-2-3-1.94M T85-1	12/4/84	76.97	12.65	1.05	0.03	0.05	0.56	0.05	4.00	4.66	100.02	0.9777
17	1198 TOLFAKE 2089 (50.32M) T90-14	3/1/85	76.94	12.69	1.08	0.07	0.04	0.57	0.11	3.85	4.65	100.00	0.9769
18	2982 SS-91-2-1C	08/17/92	76.50	12.67	1.11	0.03	0.05	0.52	0.07	4.36	4.69	100.00	0.9766
19	2998 SS-91-3-1C	08/17/92	77.17	12.30	1.07	0.03	0.06	0.54	0.05	4.23	4.54	99.99	0.9766
20	2718 FLV-202-D T249-6	1/30/92	76.79	12.79	1.06	0.02	0.04	0.58	0.07	3.96	4.68	99.99	0.9762
21	435 3-30-82-1, T43-3		76.62	12.93	1.06	0.02	0.05	0.54	0.07	4.13	4.59	100.01	0.9757
22	2963 SS-91-2-1B	08/17/92	76.57	12.72	1.05	0.02	0.05	0.51	0.07	4.34	4.68	100.01	0.9757
23	2645 JB-WA-1 T242-1	10/21/91	76.77	12.70	1.09	0.02	0.07	0.53	0.06	4.19	4.57	100.00	0.9755
24	1223 WL CORE G 180cm T92-6	5/2/85	76.64	12.88	1.11	0.04	0.05	0.57	0.06	3.99	4.67	100.01	0.9753
25	2638 JB-B3-11 T241-2	10/21/91	76.55	12.80	1.10	0.02	0.08	0.54	0.06	4.16	4.68	99.99	0.9751

SAMPLE ID: SS-91-2-1B

Date of Analysis: 08/17/92

Raw Probe Data
Raw Element Data
(FeO to Fe2O3)

Recalculated to 100%

SiO2 73.425
Al2O3 12.194
FeO 0.902*1.1113=Fe2O3 1.003
MgO 0.018
MnO 0.048
CaO 0.489
TiO2 0.067
Na2O 4.161
K2O 4.483

SiO2 76.57
Al2O3 12.72
Fe2O3 1.05
MgO 0.02
MnO 0.05
CaO 0.51
TiO2 0.07
Na2O 4.34
K2O 4.68

TOTAL(O) 95.786 TOTAL(N) 95.887 TOTAL(R) 100.01

Listing of 50 closest matches for CORP. NO. 2963 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 08/21/92
C.No Sample Number Date SiO2 Al2O3 Fe2O3 MgO MnO CaO TiO2 Na2O K2O Total, R Sim. Co

1	2963	SS-91-2-1B	08/17/92	76.57	12.72	1.05	0.02	0.05	0.51	0.07	4.34	4.60	100.01	1.0000
2	2969	SS-91-3-SuA	08/17/92	76.56	12.75	1.02	0.02	0.05	0.51	0.04	4.41	4.63	99.99	0.9904
3	2956	SS-91-3-1D	08/17/92	76.60	12.69	1.09	0.03	0.04	0.52	0.05	4.32	4.67	100.01	0.9891
4	2965	SS-91-2-Sub	08/17/92	76.62	12.69	1.09	0.04	0.05	0.52	0.08	4.31	4.61	100.01	0.9865
5	2982	SS-91-1-1C	08/17/92	76.50	12.67	1.11	0.03	0.05	0.52	0.07	4.36	4.69	100.00	0.9859
6	3006	SS-91-4-2B	08/17/92	76.94	12.60	1.03	0.04	0.04	0.51	0.04	4.13	4.66	99.99	0.9857
7	2955	SS-91-2S0A	08/17/92	76.73	12.64	1.03	0.03	0.04	0.54	0.06	4.31	4.63	100.01	0.9832
8	2640	JB-S9-13 T241-4	08/17/92	76.49	12.83	1.08	0.03	0.08	0.53	0.06	4.26	4.64	100.00	0.9830
9	2761	FLV-208A-LC T250-5	10/21/91	76.75	12.77	0.97	0.02	0.04	0.51	0.04	4.33	4.50	100.01	0.9823
10	2995	SS-91-1-3B	2/26/92	76.71	12.77	1.10	0.02	0.05	0.52	0.04	4.17	4.72	100.01	0.9820
11	2987	SS-91-3-SuB	08/17/92	76.71	12.69	1.09	0.02	0.05	0.52	0.04	4.37	4.60	100.00	0.9814
12	2762	FLV-208B-LC T250-6	08/17/92	76.51	12.77	1.10	0.03	0.04	0.53	0.05	4.29	4.63	100.00	0.9803
13	2707	FLV-192-BC T246-1	2/26/92	76.84	12.64	0.98	0.02	0.04	0.52	0.04	4.36	4.56	100.01	0.9801
14	2964	SS-91-2-3C	12/12/91	77.01	12.55	1.05	0.03	0.05	0.53	0.05	4.18	4.56	100.01	0.9791
15	2978	SS-91-1-4A	08/17/92	76.38	13.14	1.02	0.03	0.04	0.53	0.04	4.26	4.60	100.01	0.9791
16	3003	SS-91-4-4C	08/17/92	77.01	12.67	1.10	0.01	0.04	0.53	0.06	4.08	4.74	100.00	0.9774
17	2645	JB-WA-1 T242-1	08/17/92	76.77	12.70	1.09	0.02	0.07	0.53	0.06	4.19	4.57	100.00	0.9772
18	2642	JB-S9-15 T241-6	10/21/91	76.59	12.83	1.08	0.03	0.07	0.54	0.04	4.23	4.59	100.00	0.9772
19	2984	SS-91-3-1B	08/17/92	76.95	12.54	1.00	0.02	0.04	0.53	0.06	4.31	4.56	100.01	0.9772
20	2994	SS-91-1-2B	08/17/92	76.51	12.97	1.04	0.03	0.06	0.54	0.06	4.12	4.69	100.02	0.9770
21	2973	SS-91-4-5B	08/17/92	76.92	12.75	1.06	0.04	0.04	0.53	0.06	4.05	4.58	100.03	0.9763
22	684	KRL--92082D, T66-12	10/25/83	77.02	12.69	1.09	0.02	0.05	0.51	0.04	3.92	4.66	100.00	0.9757

SAMPLE ID: SS-91-2-1C

Date of Analysis: 08/17/92

Raw Probe Data

Raw Probe Data
(FeO to Fe2O3)

Raw Probe Data

SiO2	74.451	SiO2	76.50
Al2O3	12.335	Al2O3	12.67
FeO	0.972*1.1113=Fe2O3	Fe2O3	1.11
MgO	0.029	MgO	0.03
MnO	0.049	MnO	0.05
CaO	0.509	CaO	0.52
TiO2	0.066	TiO2	0.07
Na2O	4.241	Na2O	4.36
K2O	4.560	K2O	4.69

TOTAL (O)

TOTAL (N)

TOTAL (R)

Plot calcium vs iron for sample SS-91-2-3

Listing of 50 closest matches for COMP. NO. 2902 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 08/21/92													
C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total; R	Sim. Co
1	2982 SS-91-2-1C	08/17/92	76.50	12.67	1.11	0.03	0.05	0.52	0.07	4.36	4.69	100.00	1.0000
2	2956 SS-91-3-1D	08/17/92	76.60	12.69	1.09	0.03	0.04	0.52	0.05	4.32	4.67	100.01	0.9943
3	2965 SS-91-2-5aB	08/17/92	76.62	12.69	1.09	0.04	0.05	0.53	0.08	4.31	4.61	100.01	0.9917
4	2987 SS-91-3-3aB	08/17/92	76.51	12.77	1.10	0.03	0.04	0.53	0.05	4.37	4.60	100.00	0.9904
5	2995 SS-91-1-3B	08/17/92	76.71	12.69	1.09	0.02	0.05	0.52	0.04	4.17	4.72	100.01	0.9880
6	2964 SS-91-2-3C	08/17/92	76.76	12.67	1.10	0.01	0.04	0.53	0.04	4.26	4.60	100.01	0.9878
7	2963 SS-91-2-1B	08/17/92	76.57	12.72	1.05	0.02	0.05	0.51	0.07	4.34	4.68	100.01	0.9859
8	2640 JB-B8-13 T241-4	10/21/91	76.49	12.83	1.08	0.03	0.08	0.53	0.06	4.26	4.63	100.00	0.9847
9	2957 SS-91-4-4D	08/17/92	76.75	12.81	1.11	0.03	0.02	0.52	0.05	4.07	4.63	99.99	0.9844
10	2873 SS-91-3-1(31)	08/12/92	76.79	12.66	1.15	0.01	0.04	0.52	0.04	4.25	4.54	100.00	0.9839
11	2983 SS-91-2-3aC	08/17/92	76.52	12.74	1.16	0.02	0.04	0.53	0.08	4.27	4.64	100.00	0.9835
12	2996 SS-91-2-1D	08/17/92	76.36	12.74	1.18	0.03	0.05	0.53	0.07	4.32	4.72	100.00	0.9832
13	2639 JB-B8-12 T241-3	10/21/91	76.51	12.85	1.11	0.03	0.08	0.54	0.05	4.16	4.67	100.00	0.9831
14	2967 SS-91-3-1E	08/17/92	76.86	12.81	1.16	0.01	0.05	0.52	0.03	4.26	4.59	99.99	0.9826
15	2638 JB-B8-11 T241-2	10/21/91	76.55	12.80	1.10	0.02	0.08	0.54	0.06	4.16	4.68	99.99	0.9825
16	2993 SS-91-1-1B	08/17/92	76.49	12.92	1.10	0.02	0.07	0.53	0.05	4.11	4.70	99.96	0.9822
17	2645 JB-WA-1 T242-1	10/21/91	76.77	12.70	1.09	0.02	0.07	0.53	0.06	4.19	4.57	100.00	0.9821
18	3000 SS-91-3-3aC	08/17/92	76.36	12.79	1.17	0.03	0.05	0.54	0.05	4.34	4.67	100.00	0.9819
19	2875 SS-91-3-1(44)	08/12/92	76.76	12.54	1.17	0.00	0.02	0.53	0.02	4.24	4.71	99.99	0.9807
20	2716 FLV-200-1C T249-4	1/30/92	76.77	12.80	1.11	0.02	0.04	0.53	0.06	4.01	4.67	100.01	0.9805
21	2641 JB-B8-14 T241-5	10/21/91	76.55	12.82	1.11	0.02	0.07	0.55	0.06	4.20	4.62	100.00	0.9802
22	561 KBL82282A T66-5	10/25/83	76.71	12.88	1.12	0.04	0.05	0.52	0.06	3.98	4.65	100.01	0.9794
23	2637 JB-B8-9 T241-1	10/21/91	76.42	12.92	1.10	0.01	0.08	0.55	0.05	4.22	4.65	100.00	0.9792
24	2874 SS-91-3-1(32)	08/12/92	76.78	12.56	1.17	0.03	0.04	0.51	0.05	4.28	4.58	100.00	0.9792
25	2893 SS-91-3-3a(24)	08/12/92	76.33	12.86	1.18	0.02	0.02	0.54	0.02	4.32	4.71	100.00	0.9789
26	2821 JB-B8-2 T226-7	6/24/92	76.56	12.91	1.12	0.02	0.04	0.53	0.08	4.04	4.72	100.02	0.9788
27	2642 JB-B8-15 T241-6	10/21/91	76.59	12.83	1.08	0.03	0.07	0.54	0.04	4.23	4.59	100.00	0.9785
28	2842 SS-91-4-1A	08/17/92	76.70	12.72	1.12	0.02	0.04	0.54	0.05	4.08	4.75	100.02	0.9784
29	3001 SS-91-4-1A	10/21/91	76.15	13.07	1.11	0.01	0.08	0.56	0.05	4.27	4.70	100.00	0.9784
30	2682 JB-B8-9 T241-1	08/12/92	76.14	12.93	1.19	0.02	0.06	0.53	0.03	4.34	4.76	100.00	0.9783
31	2894 SS-91-3-3a(30)	08/17/92	76.56	12.75	1.02	0.02	0.05	0.51	0.04	4.41	4.63	99.99	0.9781
32	2968 SS-91-3-3aA	08/17/92	76.64	12.79	1.13	0.02	0.04	0.54	0.06	4.08	4.71	100.01	0.9776
33	2979 SS-91-1-5B	08/17/92	76.42	13.14	1.09	0.03	0.05	0.52	0.05	4.04	4.66	100.00	0.9776
34	2985 SS-91-3-2C	08/17/92	76.58	12.87	1.10	0.01	0.05	0.54	0.06	4.07	4.73	100.01	0.9771
35	2721 FLV-199-BC T249-3	1/30/92	76.08	12.71	1.13	0.02	0.03	0.53	0.06	3.90	4.66	100.00	0.9770
36	2955 SS-91-2-9DA	08/17/92	76.73	12.64	1.03	0.03	0.04	0.54	0.06	4.31	4.63	100.01	0.9769
37	2953 SS-91-2-1A	08/17/92	76.61	12.67	1.07	0.01	0.04	0.57	0.03	4.37	4.63	100.00	0.9766
38	2060 FLV-64-C9 T170-7	9/3/88	76.71	12.87	1.11	0.02	0.04	0.54	0.04	4.02	4.64	99.99	0.9760
39	1409 KBL 82182 (Al) (599) T112-1	10/22/85	76.60	12.87	1.11	0.04	0.04	0.55	0.06	4.08	4.65	100.00	0.9760
40	760 BO-16	10/23/85	76.59	12.92	1.11	0.03	0.03	0.54	0.07	4.00	4.71	100.00	0.9759
41	1419 BL-B8A-5 T112-10	10/23/85	76.98	12.65	1.09	0.04	0.04	0.53	0.05	3.93	4.60	99.99	0.9758
42	2974 SS-91-4-3aA	08/17/92	76.60	12.86	1.10	0.02	0.05	0.54	0.06	4.04	4.74	100.01	0.9757
43	566 KBL91882B, T64-12	09/06/83	76.81	12.82	1.10	0.01	0.05	0.53	0.08	3.91	4.69	100.00	0.9755
44	192 LD-12, T3.4	1/30/92	76.94	12.70	1.12	0.03	0.07	0.53	0.07	3.91	4.64	100.01	0.9750
45	2717 FLV-201-TO T249-5	1/30/92	76.05	12.77	1.10	0.02	0.04	0.54	0.04	3.99	4.65	100.00	0.9747

Date of Analysis: 08/17/92

SAMPLE ID: SS-91-2-3A

Recalculated to 100%

R_e Probe Data
(FeO to Fe2O3)

SiO2	74.259	SiO2	76.52
Al2O3	12.570	Al2O3	12.95
FeO	0.784	Fe2O3	0.90
MgO	0.031	MgO	0.03
MnO	0.034	MnO	0.04
CaO	0.641	CaO	0.66
TiO2	0.032	TiO2	0.03
Na2O	3.954	Na2O	4.07
K2O	4.655	K2O	4.80

TOTAL(R) 100.00

TOTAL' 97.049

TOTAL(O) 96.961

Listing of 50 closest matches for COMP. NO. 2997 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 08/21/92
 C.No Sample Number

	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total	R	Sim.	Co
1	2997 SS-91-2-3A	08/17/92	76.52	12.95	0.90	0.03	0.04	0.66	0.03	4.07	4.80	100.00	1.0000	
2	2976 SS-91-1-2A	08/17/92	76.49	13.01	0.88	0.05	0.08	0.66	0.05	4.02	4.76	100.00	0.9920	
3	2711 FLV-196-BC T246-5	12/12/91	76.65	12.88	0.90	0.05	0.04	0.67	0.08	3.95	4.78	100.00	0.9907	
4	2924 SS-91-1-2(6)	08/13/92	76.54	12.93	0.92	0.04	0.05	0.67	0.02	4.00	4.83	100.00	0.9897	
5	2945 SS-91-4-5(43)	08/13/92	76.60	12.91	0.91	0.06	0.05	0.68	0.08	3.96	4.75	100.00	0.9863	
6	2942 SS-91-1-8(48)	08/13/92	76.55	13.06	0.90	0.07	0.07	0.66	0.07	3.78	4.85	100.01	0.9849	
7	2921 SS-91-4-4(36)	08/13/92	76.88	12.80	0.87	0.07	0.02	0.66	0.06	3.93	4.72	100.01	0.9832	
8	695 KSCS1	08/17/92	76.82	12.90	0.85	0.01	0.00	0.66	0.05	4.00	4.70	99.99	0.9831	
9	2958 SS-91-4-5A	08/17/92	76.45	13.09	0.91	0.04	0.03	0.69	0.07	3.94	4.78	100.00	0.9830	
10	455 679-409-6, T31-1	08/17/92	76.71	13.04	0.88	0.03	0.03	0.66	0.07	3.78	4.80	100.00	0.9829	
11	573 KSL91982-K, T64-15	09/06/83	76.84	13.01	0.90	0.02	0.05	0.66	0.06	3.70	4.75	99.99	0.9816	
12	2946 SS-91-4-5(47)	08/13/92	76.55	13.03	0.93	0.04	0.00	0.68	0.04	3.91	4.82	100.00	0.9814	
13	2712 FLV-197-BC T246-6	12/12/91	76.46	12.98	0.98	0.04	0.05	0.65	0.06	4.02	4.77	100.01	0.9803	
14	2923 SS-91-1-2(8)	08/13/92	76.28	12.92	0.94	0.05	0.07	0.65	0.07	4.27	4.74	99.99	0.9796	
15	2947 SS-91-4-5(49)	08/13/92	76.63	13.06	0.83	0.01	0.01	0.65	0.00	3.99	4.81	99.99	0.9792	
16	2941 SS-91-4-5(15)	08/13/92	76.34	13.25	0.90	0.03	0.03	0.70	0.07	3.95	4.73	100.00	0.9790	
17	2909 SS-91-4-2(39)	08/13/92	76.57	12.06	0.92	0.10	0.05	0.70	0.03	3.93	4.85	100.01	0.9781	
18	574 KSL92082-A, T53-3	03/25/83	76.12	13.32	0.94	0.04	0.04	0.67	0.06	3.95	4.86	100.00	0.9779	
19	191 LD-10, T40-2	08/13/92	76.71	13.04	0.91	0.04	0.03	0.68	0.07	3.80	4.71	99.99	0.9775	
20	2709 FLV-194-BC T246-3	12/12/91	76.50	12.97	0.88	0.05	0.05	0.72	0.06	4.00	4.75	99.98	0.9775	
21	230 MONO-15, T40-3	08/13/92	76.86	12.90	0.91	0.04	0.03	0.63	0.07	3.81	4.76	100.01	0.9772	
22	180 KSL7982-11L, T44-8	08/13/92	76.76	13.01	0.92	0.02	0.03	0.63	0.04	3.89	4.70	100.00	0.9767	
23	2375 KSL880-604B, T201-5	10/12/89	76.67	13.17	0.93	0.02	0.03	0.66	0.04	3.69	4.80	100.01	0.9760	
24	2950 SS-91-3-2(50)	08/13/92	76.56	13.05	0.92	0.04	0.00	0.71	0.07	4.06	4.59	100.03	0.9756	
25	2935 SS-91-1-1(36)	08/13/92	76.31	13.22	0.91	0.06	0.06	0.67	0.03	4.23	4.51	100.00	0.9754	

Date of Analysis: 08/17/92

SAMPLE ID: SS-91-2-3B

Recalculated to 100%

Raw Probe Data
(FeO to Fe2O3)

SiO2	75.530	SiO2	77.04
Al2O3	12.461	Al2O3	12.71
FeO	0.830*1.1113=Fe2O3	Fe2O3	0.94
MgO	0.010	MgO	0.01
MnO	0.040	MnO	0.04
CaO	0.496	CaO	0.51
TiO2	0.051	TiO2	0.05
Na2O	4.051	Na2O	4.13
K2O	4.478	K2O	4.57

TOTAL (R) 100.00

TOTAL (N) 97.950

TOTAL (O) 97.950

Listing of 50 closest matches for COMP. NO. 2954 for elements: Na, Al, Si, K, Ca, Fe									
C.No Sample Number		Date		SiO2		Al2O3		Fe2O3	
				MgO		MnO		CaO	
				TiO2		Na2O		K2O	
				Total, R		Sim.		Co	
1	2954 SS-91-2-3B	08/17/92	77.04	12.71	0.94	0.01	0.04	0.51	0.05
2	3002 SS-91-4-2A	08/17/91	77.10	12.61	0.95	0.02	0.02	0.52	0.03
3	2989 SS-91-4-3B	08/17/92	77.09	12.63	0.97	0.02	0.03	0.52	0.05
4	2761 FLV-208A-LC T250-5	2/26/92	76.75	12.77	0.97	0.02	0.04	0.51	0.04
5	2028 KRL-82882-B T168-13	7/20/80	77.35	12.29	0.96	0.03	0.03	0.52	0.05
6	2494 FLV-157-89 T218-4	12/20/90	77.01	12.87	0.93	0.03	0.05	0.49	0.05
7	1309 WL 8-7 T91-12	3/1/85	77.42	12.57	0.96	0.02	0.03	0.51	0.04
8	2772 SS-91-4-4K	08/17/92	77.05	12.74	0.98	0.03	0.03	0.49	0.03
9	2030 KRL-82882-K T168-15	7/20/88	77.14	12.53	0.94	0.03	0.05	0.52	0.05
10	2859 SS-91-1-5A	08/17/92	76.66	13.08	0.97	0.02	0.05	0.51	0.04
11	2975 SS-91-1-1A	08/17/92	76.75	12.90	0.90	0.03	0.07	0.51	0.05
12	2990 SS-91-4-4B	08/17/92	77.12	12.63	0.98	0.02	0.03	0.54	0.02
13	2970 SS-91-4-3A	08/17/92	76.96	12.70	0.88	0.03	0.04	0.52	0.05
14	2026 KRL-82882-I T168-14	7/20/88	77.12	12.63	0.95	0.02	0.04	0.53	0.05
15	1420 BL-R8A-6 T112-11	10/23/85	77.08	12.78	0.97	0.02	0.04	0.53	0.04
16	3006 SS-91-4-2B	08/17/92	76.94	12.60	1.03	0.04	0.04	0.51	0.04
17	3003 SS-91-4-4C	08/17/92	77.01	12.67	1.02	0.03	0.03	0.52	0.05
18	2762 FLV-208B-LC T250-6	2/26/92	76.84	12.64	0.98	0.02	0.04	0.52	0.04
19	670 KRL-82182(A-4) T66-3	10/25/83	76.89	12.82	1.02	0.02	0.05	0.52	0.04
20	2779 FLV-207-LC T252-6	3/10/92	77.22	12.60	1.01	0.01	0.05	0.51	0.06
21	2237 SL-262.5 T186-4	2/28/89	76.96	12.94	0.96	0.03	0.04	0.52	0.06
22	2194 FLV-107-TC T182-3	1/24/89	76.81	13.14	0.92	0.03	0.02	0.51	0.06
23	2883 AA-6873 T242-4	11/13/91	77.44	12.44	0.92	0.00	0.04	0.48	0.05
24	1246 WL 8-8 4.5-10cm T93-15	5/2/85	77.31	12.71	0.96	0.02	0.05	0.53	0.05
25	1231 WL 8-7 62-64.5cm T92-15	5/1/85	77.25	12.78	0.98	0.03	0.05	0.51	0.05

Date of Analysis: 08/17/92

SAMPLE ID: SS-91-2-3C

Recalculated to 100%

Raw Probe Data
(FeO to Fe2O3)

SiO2	76.502	SiO2	76.76
Al2O3	12.625	Al2O3	12.67
FeO	0.982*1.1113=Fe2O3	Fe2O3	1.10
MgO	0.013	MgO	0.01
MnO	0.037	MnO	0.04
CaO	0.524	CaO	0.53
TiO2	0.045	TiO2	0.04
Na2O	4.242	Na2O	4.26
K2O	4.585	K2O	4.60

TOTAL(O) 99.555 TOTAL(N) 99.665 TOTAL(R) 100.01

Listing of 50 closest matches for COMP. NO. 2964 for elements: Na, Al, Si, K, Ca, Fe														Date of Update: 08/21/92			
C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	CaO	TiO2	Na2O	K2O	Total, R	Sim. Co					
1	2964 SS-91-2-3C	08/17/92	76.76	12.67	1.10	0.01	0.53	0.04	4.26	4.60	100.01	1.0000					
2	2645 JB-WA-1 T242-1	10/21/91	76.77	12.70	1.09	0.02	0.53	0.06	4.19	4.57	100.00	0.9942					
3	2987 SS-91-3-SuB	08/17/92	76.51	12.77	1.10	0.03	0.53	0.05	4.37	4.60	100.00	0.9940					
4	2640 JB-B3-13 T241-4	10/21/91	76.49	12.83	1.08	0.03	0.53	0.06	4.26	4.64	100.00	0.9929					
5	2965 SS-91-2-SuB	08/17/92	76.62	12.69	1.09	0.04	0.52	0.08	4.31	4.61	100.01	0.9925					
6	2956 SS-91-3-1D	08/17/92	76.60	12.69	1.09	0.03	0.52	0.05	4.32	4.67	100.01	0.9899					
7	2642 JB-B3-15 T241-6	10/21/91	76.59	12.83	1.08	0.03	0.54	0.04	4.23	4.59	100.00	0.9899					
8	2983 SS-91-2-SuC	08/17/92	76.52	12.74	1.16	0.02	0.53	0.08	4.27	4.64	100.00	0.9881					
9	2638 JB-B3-11 T241-2	10/21/91	76.55	12.80	1.10	0.02	0.54	0.06	4.16	4.68	99.99	0.9880					
10	2902 SS-91-2-1C	08/17/92	76.50	12.67	1.11	0.03	0.52	0.07	4.35	4.69	100.00	0.9878					
11	2995 SS-91-1-3B	08/17/92	76.71	12.69	1.09	0.02	0.52	0.04	4.17	4.72	100.01	0.9872					
12	2641 JB-B3-14 T241-5	10/21/91	76.55	12.82	1.11	0.02	0.53	0.06	4.20	4.62	100.00	0.9870					
13	2873 SS-91-3-1(31)	08/12/92	76.79	12.66	1.15	0.01	0.52	0.04	4.25	4.54	100.00	0.9868					
14	2993 SS-91-1-1B	08/17/92	76.49	12.92	1.10	0.02	0.53	0.05	4.11	4.70	99.99	0.9868					
15	2637 JB-B3-9 T241-1	10/21/91	76.42	12.92	1.10	0.01	0.55	0.05	4.22	4.65	100.00	0.9866					
16	2639 JB-B3-12 T241-3	10/21/91	76.51	12.85	1.11	0.03	0.54	0.05	4.16	4.67	100.00	0.9861					
17	2707 FLV-192-RC T746-1	12/12/91	77.01	12.55	1.05	0.03	0.53	0.05	4.18	4.56	100.01	0.9857					
18	2967 SS-91-3-1E	08/17/92	76.86	12.51	1.16	0.01	0.52	0.03	4.26	4.59	99.99	0.9856					
19	2957 SS-91-4-4D	08/17/92	76.75	12.81	1.11	0.03	0.52	0.05	4.07	4.63	99.99	0.9850					
20	2716 FLV-200-1C T249-4	1/30/92	76.77	12.80	1.11	0.2	0.54	0.06	4.01	4.67	100.01	0.9845					
21	2875 SS-91-3-1(44)	08/12/92	76.76	12.80	1.17	0.00	0.53	0.02	4.24	4.71	99.99	0.9836					
22	2973 SS-91-4-5B	08/17/92	76.92	12.75	1.06	0.04	0.53	0.06	4.05	4.58	100.03	0.9836					
23	2998 SS-91-3-1C	08/17/92	77.17	12.30	1.07	0.04	0.54	0.05	4.23	4.54	99.99	0.9833					
24	2717 FLV-201-TO T249-5	1/30/92	76.85	12.77	1.10	0.07	0.54	0.04	3.99	4.65	100.00	0.9831					
25	2955 SS-91-290A T64-11	08/17/92	76.73	12.64	1.03	0.04	0.54	0.06	4.31	4.63	100.01	0.9828					
26	564 FLV-282A T64-11	09/06/83	76.99	12.75	1.09	0.01	0.53	0.08	3.90	4.59	100.00	0.9825					
27	1419 HL-R3A-5 T112-10	10/23/85	76.98	12.65	1.09	0.04	0.53	0.05	3.93	4.68	99.99	0.9820					

Plot calcium vs iron for sample SS-91-3-S1

SAMPLE ID: S9-91-3-SUA

Date of Analysis: 08/17/92

Recalculated to 100%

Raw Probe Data
(FeO to Fe2O3)

SiO2 76.56
Al2O3 12.75
Fe2O3 1.02
MgO 0.02
MnO 0.05
CaO 0.51
TiO2 0.04
Na2O 4.41
K2O 4.63

SiO2 74.177
Al2O3 12.355
FeO 0.893=1.1113=Fe2O3 0.993
MgO 0.020
MnO 0.052
CaO 0.492
TiO2 0.042
Na2O 4.268
K2O 4.485

TOTAL(O) 96.785 TOTAL(N) 96.885 TOTAL(R) 99.99													
Listing of 50 element matches for COMP. NO. 2960 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 08/21/92													
C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total, R	Sim. Co
1	2968 S9-91-3-SUA	08/17/92	76.56	12.75	1.02	0.02	0.05	0.51	0.04	4.41	4.63	99.99	1.0000
2	2963 S9-91-2-1B	08/17/92	76.57	12.72	1.05	0.02	0.05	0.51	0.07	4.34	4.68	100.01	0.9904
3	2761 FLV-208A-1C T250-5	2/26/92	76.75	12.77	0.97	0.02	0.04	0.51	0.04	4.33	4.58	100.01	0.9863
4	3006 S9-91-4-2B	08/17/92	76.94	12.60	1.03	0.04	0.04	0.51	0.04	4.13	4.66	99.99	0.9839
5	2762 FLV-208B-1C T250-6	2/26/92	76.84	12.64	0.98	0.02	0.04	0.52	0.04	4.29	4.63	100.00	0.9837
6	2955 S9-91-250A	08/17/92	76.73	12.64	1.03	0.03	0.04	0.54	0.06	4.31	4.63	100.01	0.9835
7	3003 S9-91-4-4C	08/17/92	77.01	12.67	1.02	0.03	0.03	0.52	0.05	4.08	4.59	100.00	0.9809
8	2965 S9-91-2-SUB	08/17/92	76.62	12.69	1.09	0.04	0.05	0.52	0.08	4.31	4.61	100.01	0.9807
9	2984 S9-91-3-1B	08/17/92	76.95	12.54	1.00	0.02	0.04	0.53	0.06	4.31	4.56	100.01	0.9806
10	2956 S9-91-3-1D	08/17/92	76.60	12.69	1.09	0.03	0.04	0.52	0.05	4.32	4.67	100.01	0.9804
11	679 KSL-82182(A-4), T66-3	10/25/83	76.89	12.82	1.02	0.02	0.05	0.52	0.04	4.08	4.55	99.99	0.9798
12	2987 S9-91-3-SUB	08/17/92	76.51	12.77	1.10	0.03	0.04	0.53	0.05	4.37	4.60	100.00	0.9786
13	2978 S9-91-1-4A	08/17/92	76.38	13.14	1.02	0.03	0.04	0.51	0.06	4.08	4.74	100.00	0.9783
14	2902 S9-91-2-1C	08/17/92	76.50	12.67	1.11	0.03	0.05	0.52	0.07	4.36	4.69	100.00	0.9781
15	2640 JH-B9-13 T241-4	10/21/91	76.49	12.83	1.08	0.03	0.08	0.53	0.06	4.26	4.64	100.00	0.9772
16	2779 FLV-207-1C T252-6	3/10/92	77.22	12.60	1.01	0.01	0.05	0.51	0.06	3.95	4.56	99.97	0.9751
17	2707 FLV-192-BC T246-1	12/12/91	77.01	12.55	1.05	0.03	0.05	0.53	0.05	4.18	4.56	100.01	0.9741
18	3004 S9-91-3-2A	08/17/92	76.05	12.76	1.00	0.01	0.04	0.53	0.05	4.06	4.70	100.00	0.9740
19	2964 S9-91-2-3C	08/17/92	76.76	12.67	1.10	0.01	0.04	0.53	0.04	4.26	4.60	100.01	0.9734
20	1421 BL-R3A-7 T112-12	10/23/85	77.16	12.66	1.03	0.04	0.05	0.52	0.03	3.95	4.57	100.01	0.9732
21	2975 S9-91-1-3B	08/17/92	76.71	12.69	1.09	0.02	0.05	0.52	0.04	4.17	4.72	100.01	0.9727
22	2989 S9-91-4-3B	08/17/92	77.09	12.63	0.97	0.02	0.03	0.52	0.05	4.08	4.61	100.00	0.9727
23	2959 S9-91-1-5A	08/17/92	76.66	13.08	0.97	0.02	0.05	0.51	0.04	4.03	4.64	100.00	0.9727
24	2954 S9-91-2-3B	08/17/92	77.04	12.71	0.94	0.01	0.04	0.51	0.05	4.13	4.57	100.00	0.9726
25	2304 FLV-142-TC T203-8	4/16/90	77.51	12.24	1.03	0.00	0.06	0.51	0.08	3.98	4.60	100.01	0.9723
26	2643 JH-B9-16 T241-7	10/21/91	76.97	12.59	1.04	0.02	0.08	0.54	0.05	4.13	4.50	100.00	0.9722
27	2642 JH-B9-15 T241-6	10/21/91	76.59	12.83	1.08	0.03	0.07	0.54	0.04	4.23	4.59	100.00	0.9721
28	2953 S9-91-2-1A	08/17/92	76.61	12.67	1.07	0.01	0.04	0.57	0.03	4.37	4.63	100.00	0.9720
29	559 KSL82182(bubble wall), T56-4	07/01/83	76.87	12.92	1.01	0.02	0.03	0.53	0.03	4.03	4.55	99.99	0.9720
30	2994 S9-91-1-2B	08/17/92	76.51	12.97	1.04	0.03	0.06	0.54	0.06	4.12	4.69	100.02	0.9715
31	2645 JH-WA-1 T242-1	10/21/91	76.77	12.70	1.09	0.02	0.07	0.53	0.06	4.19	4.57	100.00	0.9714
32	1423 BL-R3A-9 T112-14	10/23/85	77.13	12.80	1.02	0.03	0.03	0.52	0.04	3.87	4.54	99.98	0.9713

SAMPLE ID: SS-91-3-SUB

Raw Probe Data	Raw Probe Data (FeO to Fe2O3)	Recalculated to 100%
SiO2	75.155	SiO2 76.54
Al2O3	12.543	Al2O3 12.77
FeO	0.976*1.1113=Fe2O3 1.085	Fe2O3 1.10
MgO	0.000	MgO 0.00
MnO	0.037	MnO 0.04
CaO	0.518	CaO 0.53
TiO2	0.053	TiO2 0.05
Na2O	4.288	Na2O 4.37
K2O	4.515	K2O 4.60
TOTAL(O)	98.085	TOTAL(R) 100.00

Listing of 50 closest matches for COMP. NO. 2987 for elements: a, Al, Si, K, Ca, Fe Date of Update: 08/21/92													
C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total, R	Sim. Co.
1	2987 SS-91-3-SuB	08/17/92	76.51	12.77	1.10	0.03	0.04	0.53	0.05	4.37	4.60	100.00	1.0000
2	2964 SS-91-2-3C	08/17/92	76.76	12.67	1.10	0.01	0.04	0.53	0.04	4.26	4.60	100.01	0.9940
3	2965 SS-91-2-SuB	08/17/92	76.62	12.69	1.09	0.04	0.05	0.52	0.08	4.31	4.61	100.01	0.9914
4	2640 JB-B9-13 T241-4	10/21/91	76.49	12.83	1.08	0.03	0.08	0.53	0.06	4.26	4.64	100.00	0.9905
5	2982 SS-91-2-1C	08/17/92	76.50	12.67	1.11	0.03	0.05	0.52	0.07	4.36	4.69	100.00	0.9904
6	2956 SS-91-3-1D	08/17/92	76.60	12.69	1.09	0.03	0.04	0.52	0.05	4.32	4.67	100.01	0.9897
7	2645 JB-WA-1 T242-1	10/21/91	76.77	12.70	1.09	0.02	0.07	0.53	0.06	4.19	4.57	100.00	0.9891
8	2642 JB-B9-15 T241-6	10/21/91	76.59	12.83	1.08	0.03	0.07	0.54	0.04	4.23	4.59	100.00	0.9872
9	2983 SS-91-2-SuC	08/17/92	76.52	12.74	1.16	0.02	0.04	0.53	0.08	4.27	4.64	100.00	0.9857
10	2638 JB-B9-11 T241-2	10/21/91	76.55	12.80	1.10	0.02	0.08	0.54	0.06	4.16	4.68	99.99	0.9856
11	2993 SS-91-1-1B	08/17/92	76.49	12.92	1.10	0.02	0.07	0.53	0.05	4.11	4.70	99.99	0.9846
12	2641 JB-B9-14 T241-5	10/21/91	76.55	12.82	1.11	0.02	0.07	0.55	0.06	4.20	4.62	100.00	0.9845
13	2637 JB-B9-9 T241-1	10/21/91	76.42	12.92	1.10	0.01	0.08	0.55	0.05	4.22	4.65	100.00	0.9843
14	2639 JB-B9-12 T241-3	10/21/91	76.51	12.85	1.11	0.03	0.08	0.54	0.05	4.16	4.67	100.00	0.9839
15	3000 SS-91-3-SuC	08/17/92	76.36	12.79	1.17	0.03	0.05	0.54	0.05	4.34	4.67	100.00	0.9827
16	2995 SS-91-1-3B	08/17/92	76.71	12.69	1.09	0.02	0.05	0.52	0.04	4.17	4.72	100.01	0.9820
17	2996 SS-91-2-1D	08/17/92	76.36	12.74	1.18	0.03	0.05	0.52	0.05	4.07	4.72	100.00	0.9818
18	2957 SS-91-4-4D	08/17/92	76.75	12.81	1.11	0.03	0.02	0.52	0.05	4.34	4.68	100.01	0.9814
19	2963 SS-91-2-1B	08/17/92	76.57	12.72	1.05	0.02	0.05	0.51	0.07	4.34	4.68	100.01	0.9813
20	2716 FLV-200-1C T249-4	1/30/92	76.77	12.80	1.11	0.02	0.04	0.53	0.06	4.01	4.67	100.01	0.9812
21	2953 SS-91-2-1A	08/17/92	76.61	12.67	1.07	0.01	0.04	0.57	0.03	4.37	4.63	100.00	0.9812
22	2873 SS-91-3-1(31)	08/12/92	76.79	12.66	1.15	0.01	0.04	0.52	0.04	4.25	4.54	100.00	0.9808
23	2955 SS-91-2SUA	08/17/92	76.73	12.64	1.03	0.03	0.04	0.54	0.06	4.31	4.63	100.01	0.9808
24	2717 FLV-201-1C T249-5	1/30/92	76.85	12.77	1.10	0.02	0.04	0.54	0.04	3.99	4.65	100.00	0.9799
25	2973 SS-91-4-5B	08/17/92	76.92	12.75	1.06	0.04	0.04	0.53	0.06	4.05	4.58	100.03	0.9799
26	2707 FLV-192-BC T246-1	12/12/91	77.01	12.55	1.05	0.03	0.05	0.53	0.05	4.18	4.56	100.01	0.9798
27	2967 SS-91-3-1E	08/17/92	76.86	12.51	1.16	0.01	0.05	0.52	0.03	4.26	4.59	99.99	0.9795
28	2985 SS-91-3-2C	08/17/92	76.59	12.07	1.10	0.01	0.05	0.54	0.06	4.07	4.73	100.01	0.9794
29	435 3-30-82-1, T43-3	08/17/92	76.62	12.93	1.06	0.02	0.05	0.54	0.07	4.13	4.59	100.01	0.9790
30	564 FLV82782A, T64-11	09/06/83	76.99	12.75	1.09	0.01	0.06	0.53	0.08	3.90	4.59	100.00	0.9789
31	2060 FLV-64-CS T170-7	9/3/88	76.71	12.87	1.11	0.02	0.04	0.54	0.04	4.02	4.64	99.99	0.9783
32	2958 SS-91-1-3-SuA	08/17/92	76.56	12.75	1.02	0.02	0.05	0.51	0.04	4.41	4.63	99.99	0.9786
33	2821 JB-B9-2 T226-7	6/24/92	76.56	12.91	1.12	0.02	0.04	0.53	0.08	4.04	4.72	100.02	0.9783
34	2893 SS-91-3-Su(24)	08/12/92	76.33	12.86	1.18	0.02	0.02	0.54	0.02	4.32	4.71	100.00	0.9783
35	567 FLV1882-K-1, T64-13	09/06/83	76.93	12.82	1.11	0.01	0.05	0.53	0.07	3.88	4.60	100.00	0.9783
36	1409 FLV 82182 (A1) (599) T112-1	10/22/85	76.60	12.87	1.11	0.04	0.04	0.55	0.06	4.08	4.65	100.00	0.9781
37	2974 SS-91-4-SuA	08/17/92	76.60	12.86	1.10	0.02	0.05	0.54	0.06	4.04	4.74	100.01	0.9780
38	566 FLV1882B, T64-12	09/06/83	76.91	12.82	1.10	0.01	0.05	0.53	0.08	3.91	4.69	100.00	0.9780
39	2894 SS-91-3-Su(30)	08/12/92	76.14	12.93	1.19	0.02	0.06	0.53	0.03	4.34	4.76	100.00	0.9778
40	2875 SS-91-3-1(44)	08/12/92	76.76	12.54	1.17	0.00	0.02	0.54	0.02	4.24	4.71	99.99	0.9776
41	2682 JB-B9-9 T241-1	10/21/91	76.15	13.07	1.11	0.01	0.08	0.56	0.05	4.27	4.70	100.00	0.9776
42	701 LD-12	08/17/92	76.94	12.72	1.12	0.03	0.07	0.53	0.07	3.91	4.61	100.00	0.9775
43	2998 SS-91-3-1C	08/17/92	77.17	12.30	1.07	0.03	0.06	0.54	0.05	4.23	4.54	99.99	0.9773
44	431 YOS-1, T13-1	08/17/92	76.61	12.93	1.12	0.03	0.05	0.54	0.07	4.03	4.64	100.02	0.9773
45	2984 SS-91-3-1B	08/17/92	76.95	12.54	1.00	0.02	0.04	0.53	0.06	4.31	4.56	100.01	0.9772
46	2986 SS-91-3-3A	08/17/92	76.64	12.79	1.13	0.02	0.04	0.54	0.06	4.08	4.71	100.01	0.9770
47	2721 FLV-199-BC T249-3	1/30/92	76.88	12.71	1.13	0.02	0.03	0.53	0.06	3.98	4.66	100.00	0.9770
48	3001 SS-91-4-1A	08/17/92	76.70	12.72	1.12	0.02	0.04	0.54	0.05	4.08	4.75	100.02	0.9765
49	1419 BL-RSA-5 T112-10	10/23/85	76.98	12.65	1.09	0.04	0.04	0.53	0.05	3.93	4.68	99.99	0.9763
50	2874 SS-91-3-1(32)	08/12/92	76.78	12.56	1.17	0.03	0.04	0.51	0.05	4.28	4.58	100.00	0.9763

Plot calcium vs iron for sample SS-91-3-1

Date of Analysis: 08/17/92

SAMPLE ID: SS-91-3-1B

Recalculated to 100%

Raw Probe Data
(FeO to Fe2O3)

SiO2 76.95
Al2O3 12.54
Fe2O3 1.00
MgO 0.02
MnO 0.04
CaO 0.53
TiO2 0.06
Na2O 4.31
K2O 4.56

TOTAL(R) 100.01

TOTAL(N) 9.425

TOTAL(O) 99.325

Listing of 50 closest matches for COMP. NO. 2984 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 08/21/92
C.No Sample Number

C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	CaO	FeO	Na2O	K2O	Total, R	Sim. Co
1	2984 SS-91-3-1B	08/17/92	76.95	12.54	1.00	0.02	0.04	0.53	0.06	4.31	4.56	100.01
2	2762 FLV-208B-LC T250-6	2/26/92	76.94	12.64	0.98	0.02	0.04	0.52	0.04	4.29	4.63	100.00
3	2955 SS-91-250A	08/17/92	76.73	12.64	1.03	0.03	0.04	0.54	0.06	4.31	4.63	100.01
4	2707 FLV-192-DC T246-1	12/12/91	77.01	12.55	1.05	0.03	0.05	0.53	0.05	4.10	4.56	100.01
5	2761 FLV-208A-LC T250-5	2/26/92	76.75	12.77	0.97	0.02	0.04	0.51	0.04	4.33	4.50	100.01
6	2990 SS-91-4-4B	08/17/92	77.12	12.63	0.98	0.02	0.03	0.54	0.02	4.09	4.57	100.00
7	3004 SS-91-3-2A	08/17/92	76.85	12.76	1.00	0.01	0.04	0.53	0.05	4.06	4.70	100.00
8	2643 JB-89-16 T241-7	10/21/91	76.97	12.59	1.04	0.02	0.08	0.54	0.05	4.13	4.58	100.00
9	559 KRL82182(bubble wall), T56-4	07/01/83	76.87	12.92	1.01	0.02	0.03	0.53	0.03	4.03	4.55	99.99
10	3003 SS-91-4-4C	08/17/92	77.01	12.67	1.02	0.03	0.03	0.52	0.05	4.08	4.59	100.00
11	679 KRL-82182(A-4), T66-3	10/25/83	76.89	12.82	1.02	0.02	0.05	0.52	0.04	4.08	4.55	99.99
12	2968 SS-91-3-5A	08/17/92	76.56	12.75	1.02	0.02	0.05	0.51	0.04	4.41	4.63	99.99
13	2989 SS-91-4-3B	08/17/92	77.09	12.63	0.97	0.02	0.03	0.52	0.05	4.08	4.61	100.00
14	2964 SS-91-2-3C	08/17/92	76.76	12.67	1.10	0.01	0.04	0.53	0.04	4.26	4.60	100.01
15	2645 JB-WA-1 T242-1	10/21/91	76.77	12.70	1.09	0.02	0.07	0.53	0.06	4.19	4.57	100.00
16	2965 SS-91-2-Sub	08/17/92	76.82	12.69	1.09	0.04	0.05	0.52	0.08	4.31	4.61	100.01
17	2998 SS-91-3-1C	08/17/92	77.17	12.30	1.07	0.03	0.06	0.54	0.05	4.23	4.54	99.99
18	1420 BL-RSA-6 T112-11	08/17/92	77.08	12.78	0.97	0.02	0.04	0.53	0.04	3.97	4.56	99.99
19	2640 JB-B3-13 T241-4	10/23/91	76.49	12.83	1.08	0.03	0.08	0.53	0.06	4.26	4.64	100.00
20	3006 SS-91-4-2B	08/17/92	76.94	12.60	1.03	0.04	0.04	0.51	0.04	4.13	4.66	99.99
21	2963 SS-91-2-1B	08/17/92	76.57	12.72	1.05	0.02	0.05	0.51	0.07	4.34	4.68	100.01
22	2987 SS-91-3-Sub	08/17/92	76.51	12.77	1.10	0.03	0.04	0.53	0.05	4.37	4.60	100.00
23	2973 SS-91-4-5B	08/17/92	76.92	12.75	1.06	0.04	0.04	0.53	0.05	4.05	4.58	100.03
24	2028 KRL-82882-B T168-13	7/20/88	77.35	12.29	0.96	0.03	0.05	0.52	0.05	4.13	4.62	100.00
25	2779 FLV-207-LC T252-6	3/10/92	77.22	12.60	1.01	0.01	0.05	0.51	0.06	3.95	4.56	99.97

SAMPLE ID: SS-91-3-1C

Date of Analysis: 08/17/92

Recalculated to 100%

Raw Probe Data
(FeO to Fe2O3)

Raw Probe Data

SiO2	77.584	SiO2	77.17
Al2O3	12.371	Al2O3	12.30
FeO	0.967*1.1113=Fe2O3	Fe2O3	1.07
MgO	0.035	MgO	0.03
MnO	0.056	MnO	0.06
CaO	0.541	CaO	0.54
TiO2	0.054	TiO2	0.05
Na2O	4.257	Na2O	4.23
K2O	4.562	K2O	4.54

TOTAL(O) 100.430

TOTAL(N) 100.537

TOTAL(R) 99.99

Listing of 50 closest matches for COMP. NO. 2998 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 08/21/92													
C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total, R	Sim. Co
1	2998 SS-91-3-1C	08/17/92	77.17	12.30	1.07	0.03	0.06	0.54	0.05	4.23	4.54	99.99	1.0000
2	2842 JB-B3-15 T241-6	10/21/91	76.59	12.93	1.08	0.03	0.07	0.54	0.04	4.23	4.59	100.00	0.9885
3	2707 FLV-192-BC T246-1	12/12/91	77.01	12.55	1.05	0.03	0.05	0.53	0.05	4.18	4.56	100.01	0.9874
4	2643 JB-B3-16 T241-7	10/21/91	76.97	12.59	1.04	0.02	0.08	0.54	0.05	4.13	4.58	100.00	0.9857
5	2645 JB-WA-1 T242-1	10/21/91	76.77	12.70	1.09	0.02	0.07	0.53	0.06	4.19	4.57	100.00	0.9851
6	435 3-30-82-1, T43-3	08/17/92	76.62	12.93	1.06	0.02	0.05	0.54	0.07	4.13	4.59	100.01	0.9834
7	2964 SS-91-2-3C	08/17/92	76.76	12.67	1.10	0.01	0.04	0.53	0.04	4.26	4.60	100.01	0.9833
8	2640 JB-B3-13 T241-4	10/21/91	76.49	12.83	1.08	0.03	0.08	0.53	0.06	4.26	4.64	100.00	0.9823
9	2955 SS-91-290A	08/17/92	76.73	12.64	1.03	0.03	0.04	0.54	0.06	4.31	4.63	100.01	0.9820
10	2973 SS-91-4-5B	08/17/92	76.92	12.75	1.06	0.04	0.04	0.54	0.06	4.05	4.50	100.03	0.9804
11	2838 JB-B3-11 T241-2	10/21/91	76.55	12.80	1.10	0.02	0.08	0.53	0.06	4.16	4.68	99.99	0.9799
12	2562 SS-91-1-5 T232-6	8/7/91	76.97	12.65	1.08	0.03	0.04	0.54	0.07	3.98	4.65	100.01	0.9796
13	2496 FLV-159-CH T219-6	12/20/90	77.01	12.76	1.08	0.03	0.03	0.54	0.05	3.94	4.57	100.01	0.9786
14	2965 SS-91-2-SuB	08/17/92	76.62	12.69	1.09	0.04	0.05	0.52	0.08	4.31	4.61	100.01	0.9788
15	2641 JB-B3-14 T241-5	10/21/91	76.55	12.82	1.11	0.02	0.07	0.55	0.06	4.20	4.62	100.00	0.9788
16	2969 SS-91-4-2C	08/17/92	76.97	12.56	1.08	0.02	0.02	0.56	0.04	4.08	4.65	99.98	0.9788
17	2984 SS-91-3-1B	08/17/92	76.95	12.54	1.00	0.02	0.04	0.53	0.06	4.31	4.56	100.01	0.9785
18	2637 JB-B3-9 T241-1	08/17/92	76.42	12.92	1.10	0.01	0.08	0.55	0.05	4.22	4.65	100.00	0.9784
19	2561 SS-91-1-4 T233-5	8/7/91	77.02	12.63	1.06	0.02	0.04	0.53	0.06	4.00	4.63	99.99	0.9784
20	2639 JB-B3-12 T241-3	10/21/91	76.51	12.85	1.11	0.03	0.09	0.54	0.05	4.16	4.67	100.00	0.9780
21	2820 JB-B3-1 T226-6	6/24/92	76.70	12.80	1.06	0.02	0.04	0.54	0.06	4.05	4.72	99.99	0.9775
22	2987 SS-91-3-SuB	08/17/92	76.51	12.77	1.10	0.03	0.04	0.53	0.05	4.37	4.60	100.00	0.9773
23	2557 SS-91-1-1 T232-2	6/8/91	76.57	12.92	1.07	0.02	0.03	0.54	0.06	4.05	4.77	99.99	0.9773
24	2977 SS-91-1-3A	08/17/92	76.67	12.62	1.08	0.03	0.05	0.56	0.05	4.17	4.77	100.00	0.9768
25	2953 SS-91-2-1A	08/17/92	76.61	12.67	1.07	0.01	0.04	0.57	0.03	4.37	4.63	100.00	0.9766
26	2956 SS-91-3-1D	08/17/92	76.60	12.69	1.09	0.03	0.04	0.52	0.05	4.32	4.67	100.01	0.9763
27	2995 SS-91-1-3B	08/17/92	76.71	12.69	1.08	0.02	0.03	0.52	0.04	4.17	4.72	100.01	0.9759
28	2873 SS-91-3-1(31)	08/12/92	76.79	12.66	1.13	0.01	0.04	0.52	0.04	4.25	4.54	100.00	0.9759
29	2994 SS-91-1-2B	08/17/92	76.51	12.97	1.04	0.03	0.06	0.54	0.06	4.12	4.69	100.02	0.9756
30	2717 FLV-201-TO T249-5	1/30/92	76.85	12.77	1.10	0.02	0.04	0.54	0.04	3.99	4.65	100.00	0.9752
31	2990 SS-91-4-4B	08/17/92	77.12	12.63	0.98	0.02	0.03	0.54	0.02	4.09	4.57	100.00	0.9749
32	2560 SS-91-1-3 T232-4	8/7/91	77.08	12.64	1.06	0.02	0.05	0.53	0.06	3.92	4.64	100.00	0.9749
33	2344 FLV-70-TC T195-4	7/21/89	77.31	12.46	1.09	0.02	0.06	0.55	0.08	3.85	4.59	100.01	0.9747
34	1224 WL CORE G 370cm T92-7	5/2/85	76.83	12.82	1.09	0.04	0.04	0.54	0.05	3.95	4.65	100.01	0.9745
35	2967 SS-91-3-1E	08/17/92	76.86	12.51	1.16	0.01	0.05	0.52	0.03	4.26	4.59	99.99	0.9744
36	682 KRL-91802G, T66-11	10/25/83	76.91	12.76	1.07	0.03	0.06	0.54	0.07	3.87	4.60	99.99	0.9743
37	1684 SCHURZ-1 T134-6	11/25/86	77.01	12.64	1.09	0.03	0.05	0.55	0.05	3.94	4.64	100.00	0.9741
38	1680 KRL 860922 A T134-2	11/25/86	76.94	12.75	1.07	0.03	0.04	0.55	0.06	3.91	4.65	100.00	0.9740
39	2180 FLV-131-FC T203-4	4/16/90	77.18	12.43	1.12	0.01	0.04	0.54	0.06	3.93	4.68	99.99	0.9740
40	2985 SS-91-3-2C	08/17/92	76.50	12.87	1.10	0.01	0.05	0.54	0.06	4.07	4.73	100.01	0.9739
41	2060 FLV-64-CS T170-7	9/3/88	76.71	12.87	1.11	0.02	0.04	0.54	0.04	4.02	4.64	99.99	0.9738
42	1418 BL-RSA-4 T112-9	10/23/85	76.83	12.79	1.08	0.04	0.04	0.55	0.06	3.96	4.65	100.00	0.9737
43	1186 WALKER LAKE CORE G 380cm T99-1	2/28/85	76.98	12.92	1.08	0.02	0.05	0.54	0.05	3.86	4.64	100.01	0.9735
44	3005 SS-91-3-2B	08/17/92	76.45	12.79	1.05	0.01	0.04	0.55	0.07	4.15	4.76	100.00	0.9734
45	3003 SS-91-4-4C	08/17/92	77.01	12.67	1.02	0.03	0.03	0.52	0.05	4.08	4.59	100.00	0.9731
46	1142 WL-2-3-2.14M T95-2	12/4/84	76.97	12.69	1.06	0.03	0.05	0.56	0.06	3.96	4.63	100.01	0.9731
47	2383 FLV-141-TC T203-7	4/16/90	77.54	12.16	1.06	0.02	0.04	0.51	0.09	3.96	4.62	100.00	0.9730

Plot calcium vs iron for sample SS-91-3-2

SAMPLE ID: SS-91-3-2A

Date of Analysis: 08/17/92

Raw Probe Data
Raw Probe Data
(FeO to Fe2O3)

Recalculated to 100%

SiO2	73.696	SiO2	76.85
Al2O3	12.235	Al2O3	12.76
FeO	0.865*1.1113=Fe2O3	Fe2O3	1.00
MgO	0.006	MgO	0.01
MnO	0.039	MnO	0.04
CaO	0.513	CaO	0.53
TiO2	0.051	TiO2	0.05
Na2O	3.889	Na2O	4.06
K2O	4.505	K2O	4.70

TOTAL(O) 95.799 TOTAL(N) 95.996 TOTAL(R) 100.00

Listing of 50 closest matches for COMP. NO. 3004 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 08/21/92

C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total, R	Sim. Co
1	3004 SS-91-3-2A	08/17/92	76.85	12.76	1.00	0.01	0.04	0.53	0.05	4.06	4.70	100.00	1.0000
2	559 KRL02182(bubble wall), T56-4	07/01/83	76.87	12.92	1.01	0.02	0.03	0.53	0.03	4.03	4.55	99.99	0.9897
3	3003 SS-91-4-4C	08/17/92	77.01	12.67	1.02	0.03	0.03	0.52	0.05	4.08	4.59	100.00	0.9873
4	762 NO-19		76.82	13.02	1.00	0.02	0.03	0.53	0.06	3.91	4.61	100.00	0.9871
5	679 KRL-02102(A-4), T66-3	10/23/03	76.89	12.82	1.02	0.02	0.05	0.52	0.04	4.00	4.32	99.99	0.9866
6	2563 SS-91-1-Adgee	8/7/91	76.73	12.85	1.04	0.03	0.03	0.53	0.07	3.95	4.74	99.99	0.9862
7	2989 SS-91-4-3B	08/17/92	77.09	12.63	0.97	0.02	0.03	0.52	0.05	4.08	4.61	100.00	0.9856
8	2973 SS-91-4-5B	08/17/92	76.92	12.75	1.06	0.04	0.04	0.53	0.06	4.05	4.58	100.03	0.9856
9	1420 RL-R3A-6 T112-11	10/23/85	77.08	12.78	0.97	0.02	0.04	0.53	0.04	3.97	4.56	99.99	0.9856
10	2820 JB-B9-1 T226-6	6/24/92	76.70	12.80	1.06	0.02	0.04	0.54	0.06	4.05	4.72	99.99	0.9855
11	2990 SS-91-4-4B	08/17/92	77.12	12.63	0.98	0.02	0.03	0.54	0.02	4.09	4.57	100.00	0.9855
12	2029 KRL-82882-1 T168-14	7/20/88	77.12	12.63	0.95	0.02	0.04	0.53	0.05	3.98	4.68	100.00	0.9854
13	2994 SS-91-1-2B	08/17/92	76.51	12.97	1.04	0.03	0.06	0.54	0.06	4.12	4.69	100.02	0.9843
14	3008 SS-91-1-8B	08/21/92	76.71	12.96	0.98	0.02	0.06	0.52	0.06	3.93	4.75	99.99	0.9836
15	2561 SS-91-1-4 T323-5	8/7/91	77.02	12.63	1.06	0.02	0.04	0.53	0.06	4.00	4.63	99.99	0.9836
16	3002 SS-91-4-2A	08/17/91	77.10	12.61	0.95	0.02	0.02	0.52	0.03	4.09	4.66	100.00	0.9834
17	2168 KRL-82902-KO T178-4	12/6/88	76.79	13.03	1.00	0.02	0.06	0.54	0.06	3.81	4.69	100.00	0.9827
18	2978 SS-91-1-4A	08/17/92	76.38	13.14	1.02	0.03	0.04	0.51	0.06	4.08	4.74	100.00	0.9824
19	3006 SS-91-4-2B	08/17/92	76.94	12.60	1.03	0.04	0.04	0.51	0.04	4.13	4.66	99.99	0.9823
20	2984 SS-91-3-1B	08/17/92	76.95	12.54	1.00	0.02	0.04	0.53	0.06	4.31	4.56	100.01	0.9823
21	2557 SS-91-1-1 T232-2	6/8/91	76.57	12.92	1.07	0.02	0.04	0.54	0.06	4.05	4.72	99.99	0.9822
22	3559 SS-91-1-2 T232-3	8/7/91	77.11	12.63	1.03	0.03	0.05	0.54	0.06	3.89	4.67	100.01	0.9818
23	569 KRL91982A, T66-9	xx/xx/83	76.70	12.95	1.01	0.03	0.06	0.53	0.06	3.83	4.84	100.01	0.9813
24	1025 KRL-71082C (590) T58-1	6/22/84	76.91	12.71	1.08	0.02	0.00	0.53	0.05	3.95	4.74	99.99	0.9809
25	2643 JB-B9-16, T241-7	10/21/91	76.97	12.59	1.04	0.02	0.08	0.54	0.05	4.13	4.58	100.00	0.9809

Date of Analysis: 08/17/92

SAMPLE ID: SS-91-3-2B

Recalculated to 100%

Raw Probe Data
(FeO to Fe2O3)

SiO2	73.462	SiO2	76.45
Al2O3	12.419	Al2O3	12.92
FeO	0.905*1.1113=Fe2O3	Fe2O3	1.05
MgO	0.010	MgO	0.01
MnO	0.036	MnO	0.04
CaO	0.525	CaO	0.55
TiO2	0.063	TiO2	0.07
Na2O	3.991	Na2O	4.15
K2O	4.577	K2O	4.76

TOTAL (R) 100.00

TOTAL (N) 96.087

TOTAL (O) 95.986

Listing of 50 closest matches for COMP. NO. 3005 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 08/21/92

C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total, R	Slm. Co
1	3005 SS-91-3-2B	08/17/92	76.45	12.92	1.05	0.01	0.04	0.55	0.07	4.15	4.76	100.00	1.0000
2	2994 SS-91-1-2B	08/17/92	76.51	12.97	1.04	0.03	0.06	0.54	0.06	4.12	4.69	100.02	0.9910
3	2961 SS-91-1-7A	08/17/92	76.64	12.93	1.06	0.02	0.05	0.55	0.06	3.96	4.73	100.00	0.9892
4	2557 SS-91-1-1 T232-2	6/8/91	76.57	12.92	1.07	0.02	0.04	0.54	0.06	4.05	4.72	99.99	0.9802
5	435 3-30-82-1, T43-3		76.62	12.93	1.06	0.02	0.05	0.54	0.07	4.13	4.59	100.01	0.9801
6	2820 JB-B3-1 T226-6	6/24/92	76.70	12.80	1.06	0.02	0.04	0.54	0.06	4.05	4.72	99.99	0.9879
7	2567 JB-B3-4 T227-1	6/13/91	76.75	12.83	1.04	0.03	0.06	0.55	0.06	3.95	4.73	100.00	0.9875
8	2977 SS-91-1-3A	08/17/92	76.67	12.62	1.08	0.03	0.05	0.56	0.05	4.17	4.77	100.00	0.9869
9	2637 JB-B3-9 T241-1	08/17/92	76.42	12.92	1.10	0.01	0.08	0.55	0.05	4.22	4.65	100.00	0.9857
10	1806 OD-ML-65CM T143-7	10/21/91	76.81	12.80	1.05	0.03	0.05	0.56	0.05	3.96	4.70	100.01	0.9850
11	2795 FLV-209-BC T234-6	6/24/97	76.36	13.11	1.09	0.03	0.06	0.53	0.07	4.01	4.73	100.01	0.9846
12	2638 JB-B3-11 T241-2	4/14/92	76.55	12.80	1.10	0.02	0.08	0.54	0.06	4.16	4.68	99.99	0.9844
13	2985 SS-91-3-2C	10/21/91	76.58	12.87	1.10	0.01	0.05	0.54	0.06	4.07	4.73	100.01	0.9842
14	2639 JB-B3-12 T241-3	08/17/92	76.51	12.85	1.11	0.03	0.08	0.54	0.05	4.16	4.67	100.00	0.9834
15	1409 FRL 82182 (Al) (599) T112-1	10/21/91	76.60	12.87	1.11	0.04	0.04	0.55	0.06	4.08	4.65	100.00	0.9834
16	2974 SS-91-4-SuA	10/22/85	76.60	12.86	1.10	0.02	0.05	0.54	0.06	4.04	4.74	100.01	0.9832
17	1223 WL CORP C 380cm T92-8	08/17/92	76.62	12.79	1.06	0.04	0.04	0.56	0.06	4.00	4.65	100.02	0.9831
18	2643 JB-B3-16 T241-7	5/2/85	76.97	12.59	1.04	0.02	0.08	0.54	0.05	4.13	4.58	100.00	0.9829
19	1141 WL-2-3-1.94M T85-1	10/21/91	76.97	12.65	1.05	0.03	0.05	0.56	0.05	4.00	4.66	100.02	0.9829
20	2980 SS-91-1-6B	12/4/84	76.97	12.65	1.05	0.03	0.05	0.56	0.05	4.00	4.66	100.02	0.9829
21	2641 JB-B3-14 T241-5	08/17/92	76.58	13.01	1.07	0.03	0.05	0.54	0.06	3.91	4.76	100.01	0.9828
22	2236 SL-115.5 T186-3	10/21/91	76.55	12.82	1.11	0.02	0.07	0.55	0.06	4.20	4.62	100.00	0.9826
23	2568 JB-B3-5 T227-2	2/28/89	76.76	12.91	1.07	0.03	0.04	0.55	0.06	3.84	4.73	99.99	0.9826
24	2993 SS-91-1-1B	6/13/91	76.69	12.91	1.08	0.02	0.05	0.55	0.05	3.90	4.70	99.99	0.9826
25	2962 SS-91-1-Sub	08/17/92	76.49	12.92	1.10	0.02	0.07	0.53	0.05	4.11	4.70	99.99	0.9826
		08/17/92	76.26	12.99	1.14	0.04	0.05	0.54	0.08	4.15	4.76	100.01	0.9825

SAMPLE ID: SS-91-3-2C

Date of Analysis: 08/17/92

Raw Probe Data
Raw Probe Data
(FeO to Fe2O3)

Recalculated to 100%

SiO2	74.044	SiO2	76.58
Al2O3	12.442	Al2O3	12.87
FeO	0.957*1.1113=Fe2O3	Fe2O3	1.10
MgO	0.009	MgO	0.01
MnO	0.045	MnO	0.05
CaO	0.518	CaO	0.54
TiO2	0.061	TiO2	0.06
Na2O	3.935	Na2O	4.07
K2O	4.576	K2O	4.73

TOTAL (O)		96.587	TOTAL (N)		96.694	TOTAL (R)		100.01	Date of Update: 08/21/92		K2O		Total, R. Sim. Co
Listing of 50 closest matches for COMP. NO. 2985 for elements: Na, Al, Si, K, Ca, Fe, MgO, MnO, CaO, TiO2, Na2O, K2O													
C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total, R. Sim. Co	
1	2985 SS-91-3-2C	08/17/92	76.58	12.87	1.10	0.01	0.05	0.54	0.06	4.07	4.73	100.01	1.0000
2	2974 SS-91-4-Sua	08/17/92	76.60	12.86	1.10	0.02	0.05	0.54	0.06	4.04	4.74	100.01	0.9982
3	760 BO-16		76.59	12.92	1.11	0.03	0.03	0.54	0.07	4.00	4.71	100.00	0.9943
4	3001 SS-91-4-1A	08/17/92	76.70	12.72	1.12	0.02	0.04	0.54	0.05	4.08	4.75	100.02	0.9937
5	2638 JB-BB-11 T241-2	10/21/91	76.55	12.80	1.10	0.02	0.08	0.54	0.06	4.16	4.69	99.99	0.9936
6	2557 SS-91-1-1 T232-2	6/8/91	76.57	12.92	1.07	0.02	0.04	0.54	0.05	4.05	4.72	99.99	0.9936
7	2993 SS-91-1-1B	08/17/92	76.49	12.92	1.10	0.02	0.07	0.53	0.05	4.11	4.70	99.99	0.9934
8	2986 SS-91-3-3A	08/17/92	76.64	12.79	1.13	0.02	0.04	0.54	0.06	4.08	4.71	100.01	0.9933
9	2060 FLV-64-CS T170-7	9/3/80	76.71	12.87	1.11	0.02	0.04	0.54	0.04	4.02	4.64	99.99	0.9930
10	2639 JB-BB-12 T241-3	20/21/91	76.51	12.85	1.11	0.03	0.08	0.54	0.05	4.16	4.67	100.00	0.9924
11	1409 KRL 82182 (Al) (599) T112-1	10/22/85	76.60	12.87	1.11	0.04	0.04	0.54	0.06	4.08	4.65	100.00	0.9922
12	2717 FLV-201-TO T249-5	1/30/92	76.85	12.77	1.10	0.02	0.04	0.54	0.04	3.99	4.65	100.00	0.9920
13	2821 JB-BB-2 T226-7	6/24/92	76.56	12.91	1.12	0.02	0.04	0.53	0.08	4.04	4.72	100.02	0.9918
14	2820 JB-BB-1 T226-6	6/24/92	76.70	12.80	1.06	0.02	0.04	0.54	0.06	4.05	4.72	99.99	0.9916
15	2570 JB-BB-7 T227-4	6/13/91	76.73	12.89	1.10	0.03	0.05	0.54	0.06	3.91	4.69	100.00	0.9915
16	431 YOS-1, T13-1	08/17/92	76.61	12.93	1.12	0.03	0.05	0.54	0.07	4.03	4.64	100.02	0.9914
17	2999 SS-91-3-2D	08/17/92	76.61	12.80	1.15	0.01	0.05	0.54	0.05	4.06	4.73	100.00	0.9914
18	2558 SS-91-1-9U T232-1	8/6/91	76.74	12.86	1.09	0.04	0.04	0.54	0.05	3.95	4.68	99.99	0.9913
19	681 KRL-91882A, T66-8	10/25/83	76.79	12.83	1.10	0.03	0.06	0.54	0.07	3.91	4.67	100.00	0.9904
20	1224 WL CORE G 370cm T92-7	5/2/85	76.83	12.82	1.09	0.04	0.04	0.54	0.05	3.95	4.65	100.01	0.9896
21	2716 FLV-200-LC T249-4	1/30/92	76.77	12.80	1.11	0.02	0.04	0.53	0.06	4.01	4.67	100.01	0.9895
22	2795 FLV-209-BC T254-6	4/14/92	76.36	13.11	1.09	0.03	0.06	0.55	0.07	4.01	4.73	100.01	0.9895
23	2991 SS-91-4-5C	08/17/92	76.73	12.76	1.14	0.03	0.03	0.54	0.05	4.02	4.70	100.00	0.9893
24	3009 SS-91-1-8C	08/21/92	76.60	12.93	1.08	0.01	0.05	0.54	0.06	3.90	4.75	100.00	0.9883
25	566 KRL91882B, T64-12	09/06/83	76.81	12.82	1.10	0.01	0.05	0.53	0.08	3.91	4.69	100.00	0.9878

SAMPLE ID: SS-91-3-2D

Date of Analysis: 08/17/92

Raw Probe Data
(FeO to F 203)

Recalculated to 100%

SiO2	74.220	SiO2	76.61
Al2O3	12.401	Al2O3	12.80
FeO	1.001*1.1113=Fe2O3	Fe2O3	1.15
MgO	0.010	MgO	0.01
MnO	0.046	MnO	0.05
CaO	0.526	CaO	0.54
TiO2	0.053	TiO2	0.05
Na2O	3.932	Na2O	4.06
K2O	4.579	K2O	4.73

TOTAL(O) 96.767 TOTAL(N) 96.878 TOTAL(R) 100.00

Listing of 50 closest matches for COMP. NO. 2999 for elements: Na, Al, Si, K, Ca, Fe													Date of Update: 08/21/92		K2O Total, R. Sim. Co	
C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total, R. Sim. Co				
1	2999 SS-91-3-2D	08/17/92	76.61	12.80	1.15	0.01	0.05	0.54	0.05	4.06	4.73	100.00	1.0000			
2	1972 WL-4-58 (144.77m)	5/21/88	76.73	12.71	1.15	0.00	0.03	0.54	0.12	4.02	4.69	99.99	0.9955			
3	2986 SS-91-3-3A	08/17/92	76.64	12.79	1.13	0.02	0.04	0.54	0.06	4.08	4.71	100.01	0.9954			
4	2991 SS-91-4-5C	08/17/92	76.73	12.76	1.14	0.03	0.03	0.54	0.05	4.02	4.70	100.00	0.9951			
5	3001 SS-91-4-1A	08/17/92	76.70	12.72	1.12	0.02	0.04	0.54	0.05	4.08	4.75	100.02	0.9929			
6	2985 SS-91-3-2C	08/17/92	76.50	12.87	1.10	0.01	0.05	0.54	0.06	4.07	4.73	100.01	0.9924			
7	2974 SS-91-4-9uA	08/17/92	76.60	12.86	1.10	0.02	0.05	0.54	0.06	4.04	4.74	100.01	0.9908			
8	2962 SS-91-1-8uB	08/17/92	76.26	12.99	1.12	0.04	0.05	0.54	0.08	4.15	4.76	100.01	0.9907			
9	2821 JB-B9-2 T226-7	6/24/92	76.56	12.91	1.14	0.02	0.04	0.54	0.08	4.04	4.72	100.02	0.9899			
10	431 Y03-1, T13-1		76.61	12.93	1.12	0.03	0.05	0.54	0.07	4.03	4.64	100.02	0.9896			
11	760 BO-16		76.59	12.92	1.11	0.03	0.03	0.54	0.07	4.00	4.71	100.00	0.9894			
12	2871 SS-91-3-2(51)	08/12/92	76.59	12.79	1.22	0.00	0.00	0.54	0.10	4.04	4.74	100.00	0.9890			
13	1240 WL-4-2 3.29m T93-9	5/2/85	76.75	12.79	1.13	0.03	0.04	0.55	0.05	4.02	4.64	100.00	0.9888			
14	2060 FLV-64-CS T170-7	9/3/80	76.71	12.87	1.11	0.02	0.04	0.54	0.04	4.02	4.64	99.99	0.9883			
15	2869 SS-91-3-2(14)	08/12/92	76.75	12.60	1.20	0.04	0.05	0.54	0.03	3.99	4.72	100.00	0.9880			
16	750 HC-10		76.27	13.21	1.15	0.03	0.03	0.53	0.07	4.00	4.70	99.99	0.9875			
17	2992 SS-91-4-8uB	08/17/92	76.58	12.86	1.19	0.03	0.06	0.53	0.05	4.01	4.70	100.01	0.9874			
18	2639 JB-B9-12 T241-3	10/21/91	76.51	12.85	1.11	0.03	0.08	0.54	0.05	4.16	4.67	100.00	0.9872			
19	2638 JB-B9-11 T241-2	10/21/91	76.55	12.80	1.10	0.02	0.08	0.54	0.06	4.16	4.68	99.99	0.9869			
20	1409 KPL 82182 (Al) (599) T112-1	10/22/85	76.60	12.87	1.11	0.04	0.04	0.55	0.04	4.08	4.65	100.00	0.9866			
21	2716 FLV-200-LC T249-4	1/30/92	76.77	12.80	1.11	0.02	0.04	0.53	0.06	4.01	4.67	100.01	0.9866			
22	2721 FLV-199-BC T249-3	1/30/92	76.88	12.71	1.13	0.02	0.03	0.53	0.06	3.98	4.66	100.00	0.9865			
23	1417 BL-R9A-3 T112-8	10/23/85	76.83	12.80	1.15	0.04	0.05	0.55	0.05	3.89	4.64	100.00	0.9863			
24	1416 BL-R9A-2 T112-7	10/23/85	76.78	12.85	1.12	0.04	0.03	0.54	0.06	3.90	4.68	100.00	0.9863			
25	788 GS-32		76.58	12.90	1.13	0.03	0.04	0.56	0.06	4.00	4.70	100.00	0.9863			
26	2717 FLV-201-TO T249-5	1/30/92	76.85	12.77	1.10	0.02	0.04	0.54	0.04	3.99	4.65	100.00	0.9862			
27	1241 WL-4-2 3.31m T93-10	5/2/85	76.69	12.91	1.14	0.04	0.04	0.55	0.06	3.92	4.67	100.02	0.9861			

Plot calcium vs iron for sample SS-91-3-3

Date of Analysis: 08/17/92

SAMPLE ID: SS-91-3-3A

Recalculated to 100%

Raw Probe Data
(FeO to Fe2O3)

SiO2	74.102	SiO2	76.64
Al2O3	12.365	Al2O3	12.79
FeO	0.981*1.1113=Fe2O3	Fe2O3	1.13
MgO	0.015	MgO	0.02
MnO	0.042	MnO	0.04
CaO	0.522	CaO	0.54
TiO2	0.056	TiO2	0.06
Na2O	3.943	Na2O	4.08
K2O	4.558	K2O	4.71

TOTAL(R) 100.01

TOTAL(O) 96.584

TOTAL(N) 96.693

Listing of 50 closest matches for COMP. NO. 2986 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 08/21/92

C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	CaO	TiO2	Na2O	K2O	Total	R	Sim.	Co
1	2986 SS-91-3-3A	08/17/92	76.64	12.79	1.13	0.02	0.04	0.54	0.06	4.08	4.71	100.01	1.0000	
2	3001 SS-91-4-1A	08/17/92	76.70	12.72	1.12	0.02	0.04	0.54	0.05	4.08	4.75	100.02	0.9961	
3	2999 SS-91-3-2D	08/17/92	76.61	12.80	1.15	0.01	0.05	0.54	0.05	4.06	4.73	100.00	0.9954	
4	2991 SS-91-4-5C	08/17/92	76.73	12.76	1.14	0.03	0.03	0.54	0.05	4.02	4.70	100.00	0.9951	
5	2995 SS-91-3-2C	08/17/92	76.58	12.87	1.10	0.01	0.05	0.54	0.06	4.07	4.73	100.01	0.9933	
6	1972 WL-4-58 (144.77m) T164-1	5/21/88	76.73	12.71	1.15	0.00	0.03	0.54	0.12	4.02	4.69	99.99	0.9927	
7	431 YCS-1, T13-1		76.61	12.93	1.12	0.03	0.05	0.54	0.07	4.03	4.64	100.02	0.9921	
8	760 BO-16		76.59	12.92	1.11	0.03	0.03	0.54	0.07	4.00	4.71	100.00	0.9920	
9	2974 SS-91-4-SuA	08/17/92	76.60	12.86	1.10	0.02	0.05	0.54	0.06	4.04	4.74	100.01	0.9919	
10	1240 WL 4-2 3.29m T93-9	5/2/85	76.75	12.79	1.13	0.03	0.04	0.55	0.05	4.02	4.64	100.00	0.9918	
11	2821 JB-B3-2 T226-7	6/26/92	76.56	12.91	1.12	0.02	0.04	0.53	0.08	4.04	4.72	100.02	0.9917	
12	2639 JB-B3-12 T241-3	10/21/91	76.51	12.85	1.11	0.03	0.08	0.54	0.05	4.16	4.67	100.00	0.9914	
13	2638 JB-B3-11 T241-2	10/21/91	76.55	12.80	1.10	0.02	0.08	0.54	0.06	4.16	4.68	99.99	0.9910	
14	2060 FLV-64-CS T170-7	9/3/88	76.71	12.87	1.11	0.02	0.04	0.54	0.04	4.02	4.64	99.98	0.9909	
15	1409 KUL 82182 (A1) (599) T112-1	10/22/85	76.60	12.87	1.11	0.04	0.04	0.55	0.06	4.08	4.65	100.00	0.9908	
16	2962 SS-91-1-SuB	08/17/92	76.26	12.99	1.14	0.04	0.05	0.54	0.08	4.15	4.76	100.01	0.9906	
17	2721 FLV-199-BC T249-3	1/30/92	76.88	12.71	1.13	0.02	0.03	0.53	0.06	3.98	4.66	100.00	0.9895	
18	2716 FLV-200-LC T249-4	1/30/92	76.77	12.80	1.11	0.02	0.04	0.53	0.06	4.01	4.67	100.01	0.9893	
19	2717 FLV-201-TO T249-5	1/30/92	76.85	12.77	1.10	0.02	0.04	0.54	0.04	3.99	4.65	100.00	0.9891	
20	1416 BL-RSA-2 T112-7	10/23/85	76.78	12.85	1.12	0.04	0.03	0.54	0.06	3.90	4.60	100.00	0.9890	
21	2993 SS-91-1-18	08/17/92	76.49	12.92	1.10	0.02	0.07	0.53	0.05	4.11	4.70	99.99	0.9889	
22	788 GS-32		76.58	12.90	1.13	0.03	0.04	0.56	0.06	4.00	4.70	100.00	0.9887	
23	560 KUL82282, T66-4	xx/xx/83	76.74	12.90	1.13	0.02	0.06	0.54	0.06	3.87	4.68	100.00	0.9877	
24	2820 JB-B3-1 T226-6	6/24/92	76.70	12.80	1.06	0.02	0.04	0.54	0.06	4.05	4.72	99.99	0.9878	
25	2557 SS-91-1-1 T232-2	6/8/91	76.57	12.92	1.07	0.02	0.04	0.54	0.06	4.05	4.72	99.99	0.9877	

Date of Analysis: 08/17/92

SAMPLE ID: SS-91-4-SuA

Recalculated to 100%

Raw Probe Data
(FeO to Fe2O3)

SiO2	73.642	SiO2	76.60
Al2O3	12.364	Al2O3	12.86
FeO	0.950*1.1113=Fe2O3	Fe2O3	1.10
MgO	0.018	MgO	0.02
MnO	0.046	MnO	0.05
CaO	0.520	CaO	0.54
TiO2	0.054	TiO2	0.06
Na2O	3.882	Na2O	4.04
K2O	4.559	K2O	4.74

TOTAL(R) 100.01

TOTAL(N) 96.142

TOTAL(O) 96.036

Listing of 50 closest matches for COMP. NO. 2974 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 08/21/92

C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total, R	Sim. Co
1	2974 SS-91-4-SuA	08/17/92	76.60	12.86	1.10	0.02	0.05	0.54	0.06	4.04	4.74	100.01	1.0000
2	2985 SS-91-3-2C	08/17/92	76.58	12.87	1.10	0.01	0.05	0.54	0.06	4.07	4.73	100.01	0.9982
3	760 BO-16		76.59	12.92	1.11	0.03	0.03	0.54	0.07	4.00	4.71	100.00	0.9950
4	2060 FLV-64-CS T170-7	9/3/88	76.71	12.87	1.11	0.02	0.04	0.54	0.04	4.02	4.64	99.99	0.9930
5	2557 SS-91-1-1 T232-2	6/8/91	76.57	12.92	1.07	0.02	0.04	0.54	0.06	4.05	4.72	99.99	0.9935
6	2717 FLV-201-TO T249-5	1/30/92	76.85	12.77	1.10	0.02	0.04	0.54	0.04	3.99	4.65	100.00	0.9931
7	3001 SS-91-4-1A	08/17/92	76.70	12.72	1.12	0.02	0.04	0.54	0.05	4.08	4.75	100.02	0.9930
8	2821 JB-B8-2 T226-7	6/24/92	76.56	12.91	1.12	0.02	0.04	0.54	0.08	4.04	4.72	100.02	0.9925
9	2558 SS-91-1-SO T232-1	8/6/91	76.74	12.86	1.09	0.04	0.04	0.54	0.05	3.95	4.68	99.99	0.9924
10	2570 JB-B8-7 T227-4	6/13/91	76.73	12.89	1.10	0.03	0.05	0.54	0.06	3.91	4.69	100.00	0.9922
11	2638 JB-B8-11 T241-2	10/21/91	76.55	12.80	1.10	0.02	0.08	0.54	0.06	4.16	4.68	99.99	0.9922
12	431 YOS-1, T13-1		76.61	12.93	1.12	0.03	0.05	0.54	0.07	4.03	4.64	100.02	0.9922
13	2986 SS-91-3-3A	08/17/92	76.64	12.79	1.13	0.02	0.04	0.54	0.06	4.08	4.71	100.01	0.9919
14	2820 JB-B8-1 T226-6	6/24/92	76.70	12.80	1.06	0.02	0.04	0.54	0.06	4.05	4.72	99.99	0.9918
15	2993 SS-91-1-1B	08/17/92	76.49	12.92	1.10	0.02	0.07	0.53	0.05	4.11	4.70	99.99	0.9917
16	681 KRL-91882A, T66-8	10/25/93	76.79	12.83	1.10	0.03	0.06	0.54	0.07	3.91	4.67	100.00	0.9914
17	2639 JB-B8-12 T241-3	10/21/91	76.51	12.85	1.11	0.03	0.08	0.54	0.05	4.16	4.67	100.00	0.9909
18	2999 SS-91-3-2D	08/17/92	76.61	12.80	1.15	0.01	0.05	0.54	0.05	4.06	4.73	100.00	0.9908
19	1224 WL CORE G 370cm T92-7	5/2/85	76.83	12.82	1.09	0.04	0.04	0.54	0.05	3.95	4.65	100.01	0.9906
20	2716 FLV-200-LC T249-4	1/30/92	76.77	12.80	1.11	0.02	0.04	0.53	0.06	4.01	4.67	100.01	0.9905
21	1409 KRL 82182 (A1) (599) T112-1	10/22/95	76.60	12.87	1.11	0.04	0.04	0.53	0.06	4.08	4.65	100.00	0.9905
22	2991 SS-91-4-5C	08/17/92	76.73	12.76	1.14	0.03	0.03	0.54	0.05	4.02	4.70	100.00	0.9903
23	2795 FLV-209-BC T254-6	4/14/92	76.36	13.11	1.09	0.03	0.06	0.55	0.07	4.01	4.73	100.01	0.9902
24	3009 SS-91-1-8C	08/21/92	76.68	12.93	1.08	0.01	0.05	0.54	0.06	3.90	4.75	100.00	0.9898
25	566 KRL91882B, T64-12	09/06/83	76.81	12.82	1.10	0.01	0.05	0.53	0.08	3.91	4.69	100.00	0.9880

Plot calcium vs iron for sample SS-91-4-1

Date of Analysis: 08/17/92

SAMPLE ID: SS-91-4-1A

Recalculated to 100%

Raw Probe Data
(FeO to Fe2O3)

SiO2	74.358	SiO2	76.70
Al2O3	12.327	Al2O3	12.72
FeO	0.973*1.1113=Fe2O3	Fe2O3	1.082
MgO	0.019	MgO	0.02
MnO	0.039	MnO	0.04
CaO	0.520	CaO	0.54
TiO2	0.046	TiO2	0.05
Na2O	3.951	Na2O	4.08
K2O	4.605	K2O	4.75

TOTAL (R) 100.02

TOTAL (N) 96.947

TOTAL (O) 96.838

Listing of 50 closest matches for COMP. NO. 3001 for elements: Na, Al, Si, K, Ca, Fe										Date of Update: 08/21/92		
C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	H2O	MnO	CaO	TiO2	Na2O	K2O	Total, R Sim. Co
1	3001 SS-91-4-1A	08/17/92	76.70	12.72	1.12	0.02	0.04	0.54	0.03	4.08	4.75	100.02 1.0000
2	2986 SS-91-3-3A	08/17/92	76.64	12.79	1.13	0.02	0.04	0.54	0.06	4.08	4.71	100.01 0.9961
3	2985 SS-91-3-2C	08/17/92	76.58	12.87	1.10	0.01	0.03	0.54	0.06	4.07	4.73	100.01 0.9937
4	2974 SS-91-4-8uA	08/17/92	76.40	12.84	1.10	0.02	0.03	0.54	0.06	4.04	4.74	100.01 0.9930
5	2999 SS-91-3-2D	08/17/92	76.41	12.84	1.13	0.01	0.03	0.54	0.05	4.06	4.73	100.00 0.9929
6	2991 SS-91-4-5C	08/17/92	76.73	12.76	1.14	0.03	0.03	0.54	0.05	4.02	4.70	100.00 0.9923
7	2821 JB-B9-2 T226-7	6/24/92	76.56	12.91	1.12	0.02	0.04	0.53	0.04	4.04	4.72	100.02 0.9915
8	431 YOS-1, T13-1		76.61	12.93	1.12	0.03	0.05	0.54	0.07	4.03	4.64	100.02 0.9912
9	760 BO-16		76.59	12.92	1.11	0.03	0.03	0.54	0.07	4.00	4.71	100.00 0.9910
10	1972 WL-4-58 (144.77m) T164-1	5/21/88	76.73	12.71	1.13	0.00	0.03	0.54	0.12	4.02	4.69	99.99 0.9909
11	2639 JB-B9-12 T241-3	10/21/91	76.51	12.85	1.11	0.03	0.08	0.54	0.05	4.16	4.67	100.00 0.9904
12	2060 FLV-64-CS T170-7	9/3/88	76.71	12.87	1.11	0.02	0.04	0.54	0.04	4.02	4.64	99.99 0.9902
13	2638 JB-B9-11 T241-2	10/21/91	76.55	12.80	1.10	0.02	0.08	0.54	0.06	4.16	4.68	99.99 0.9900
14	1409 KQL 82182 (Al) (599) T112-1	10/22/85	76.60	12.99	1.11	0.04	0.04	0.55	0.06	4.00	4.65	100.00 0.9898
15	2962 SS-91-1-SuB	08/17/92	76.26	12.99	1.14	0.04	0.05	0.54	0.08	4.15	4.76	100.01 0.9895
16	2717 FLV-201-TO T249-5	1/30/92	76.85	12.77	1.10	0.02	0.04	0.54	0.04	3.99	4.65	100.00 0.9889
17	1029 KRL-99182K-1P (595) T58-6	6/22/84	76.79	12.72	1.13	0.03	0.00	0.54	0.05	3.91	4.83	100.00 0.9886
18	2716 FLV-200-LC T249-4	1/30/92	76.77	12.80	1.11	0.02	0.04	0.53	0.06	4.01	4.67	100.01 0.9886
19	1416 BL-RSA-2 T112-7	10/23/85	76.78	12.85	1.12	0.04	0.03	0.54	0.06	3.90	4.68	100.00 0.9883
20	1240 WL-4-2, 1, 22m I93-9	5/2/85	76.75	12.79	1.13	0.03	0.04	0.55	0.05	4.02	4.64	100.00 0.9882
21	2993 SS-91-1-1B	08/17/92	76.49	12.92	1.10	0.02	0.07	0.53	0.05	4.11	4.70	99.99 0.9879
22	2820 JB-B9-1 T226-6	6/24/92	76.70	12.80	1.06	0.02	0.04	0.54	0.06	4.05	4.72	99.99 0.9878
23	2721 FLV-199-BC T249-3	1/30/92	76.88	12.71	1.13	0.02	0.03	0.53	0.06	3.98	4.66	100.00 0.9877
24	2557 SS-91-1-1 T232-2	6/8/91	76.57	12.92	1.07	0.02	0.04	0.54	0.06	4.05	4.72	99.99 0.9874
25	2380 FLV-131-FC T203-4	4/16/90	77.18	12.43	1.12	0.01	0.04	0.54	0.06	3.93	4.68	99.99 0.9866

Plot calcium vs iron for sample SS-91-4-2

Date of Analysis: 08/17/92

SAMPLE ID: SS-91-4-2B

Recalculated to 100%

Raw Probe Data
(FeO to F. 13)

SiO2	74.537	SiO2	76.94
Al2O3	12.209	Al2O3	12.60
FeO	0.900*1.1113=Fe2O3	Fe2O3	1.03
MgO	0.039	MgO	0.04
MnO	0.043	MnO	0.04
CaO	0.499	CaO	0.51
TiO2	0.040	TiO2	0.04
Na2O	3.997	Na2O	4.13
K2O	4.519	K2O	4.66

TOTAL(O) 96.782 TOTAL(N) 5.882 TOTAL(R) 99.99

Listing of 50 closest matches for COMP. NO. 3006 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 08/21/92													
C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total, R	Sim. Co
1	3006 SS-91-4-2B	08/17/92	76.94	12.60	1.03	0.04	0.04	0.51	0.04	4.13	4.66	99.99	1.0000
2	3003 SS-91-4-4C	08/17/92	77.01	12.67	1.02	0.03	0.03	0.52	0.05	4.08	4.59	100.00	0.9896
3	679 KRL-82182(A-4), T66-3	10/25/83	76.09	12.82	1.02	0.02	0.03	0.52	0.04	4.00	4.55	99.99	0.9863
4	1643 JN-83-16 T241-7	10/21/91	76.97	12.59	1.04	0.02	0.08	0.54	0.05	4.13	4.58	100.00	0.9862
5	2384 FLV-142-TC T203-8	4/16/90	77.51	12.24	1.03	0.00	0.06	0.51	0.08	3.90	4.60	100.01	0.9858
6	2963 SS-91-2-1B	08/17/92	76.57	12.72	1.05	0.02	0.05	0.51	0.07	4.34	4.68	100.01	0.9857
7	2978 SS-91-1-4A	08/17/92	76.38	13.14	1.62	0.03	0.04	0.51	0.06	4.08	4.74	100.00	0.9855
8	2779 FLV-207-LC T252-6	3/10/92	77.22	12.60	1.01	0.01	0.05	0.51	0.06	3.95	4.56	99.97	0.9853
9	1421 BL-RSA-7 T112-12	10/23/85	77.16	12.66	1.03	0.04	0.05	0.52	0.03	3.95	4.57	100.01	0.9850
10	2701 FLV-192-BC T246-1	12/12/91	77.01	12.55	1.05	0.03	0.05	0.53	0.05	4.10	4.56	100.01	0.9842
11	2968 SS-91-3-SUA	08/17/92	76.56	12.75	1.02	0.02	0.05	0.51	0.04	4.41	4.63	99.99	0.9839
12	2989 SS-91-4-3B	08/17/92	77.09	12.63	0.97	0.02	0.03	0.52	0.05	4.00	4.61	100.00	0.9826
13	3004 SS-91-3-2A	08/17/92	76.85	12.76	1.00	0.01	0.04	0.53	0.05	4.06	4.70	100.00	0.9823
14	2995 SS-91-1-3N	08/17/92	76.71	12.69	1.09	0.02	0.05	0.52	0.04	4.17	4.72	100.01	0.9822
15	2561 SS-91-1-4 T323-5	8/7/91	77.02	12.63	1.06	0.02	0.04	0.53	0.06	4.00	4.63	99.99	0.9821
16	2994 SS-91-1-2B	08/17/92	76.51	12.97	1.04	0.03	0.06	0.54	0.06	4.12	4.69	100.02	0.9820
17	3002 SS-91-4-2A	08/17/91	77.10	12.61	0.95	0.02	0.02	0.52	0.03	4.09	4.66	100.00	0.9818
18	2955 SS-91-2SUA	08/17/92	76.73	12.64	1.03	0.03	0.04	0.54	0.06	4.31	4.63	100.01	0.9817
19	684 KRL-92082D, T66-12	10/25/83	77.02	12.69	1.09	0.02	0.05	0.51	0.04	3.92	4.66	100.00	0.9810
20	2973 SS-91-4-5B	08/17/92	76.92	12.75	1.06	0.04	0.04	0.53	0.06	4.05	4.58	100.03	0.9809
21	2762 FLV-208B-LC T250-6	2/26/92	76.84	12.64	0.98	0.02	0.04	0.52	0.04	4.29	4.63	100.00	0.9807
22	2954 SS-91-2-3B	08/17/92	77.04	12.71	0.94	0.01	0.04	0.51	0.05	4.13	4.57	100.00	0.9806
23	2559 SS-91-1-2 T232-3	8/7/91	77.11	12.63	1.03	0.03	0.05	0.54	0.06	3.89	4.67	100.01	0.9799
24	2383 FLV-141-TC T203-7	4/16/90	77.54	12.16	1.06	0.02	0.04	0.51	0.09	3.96	4.62	100.00	0.9799
25	2381 FLV-135-TC T203-5	4/16/90	77.64	12.17	1.00	0.01	0.04	0.51	0.06	3.99	4.58	100.00	0.9794

SAMPLE ID: SS-91-4-2C		Date of Analysis: 08/17/92	
Raw Probe Data		Recalculated to 100%	
SiO2	75.305	SiO2	76.97
Al2O3	12.292	Al2O3	12.56
FeO	0.951*1.1113=Fe2O3	Fe2O3	1.08
MgO	0.020	MgO	0.02
MnO	0.023	MnO	0.02
CaO	0.549	CaO	0.56
TiO2	0.039	TiO2	0.04
Na2O	3.995	Na2O	4.08
K2O	4.551	K2O	4.65
TOTAL(O)	97.726	TOTAL(R)	99.98

Listing of 50 closest matches for COMP. NO. 2969 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 08/21/92													
C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	CaO	Fe	Na2O	K2O	Total, R	Sim.	Co
1	2969 SS-91-4-2C	08/17/92	76.97	12.56	1.08	0.02	0.02	0.56	0.04	4.08	4.65	99.28	1.0000
2	2977 SS-91-1-3A	08/17/92	76.67	12.62	1.08	0.03	0.05	0.56	0.05	4.17	4.77	100.00	0.9908
3	1141 WL-2-3-1.94M T85-1	12/4/84	76.97	12.65	1.05	0.03	0.05	0.56	0.05	4.00	4.66	100.02	0.9906
4	1225 WL CORE G 380cm T92-8	5/2/85	76.82	12.79	1.06	0.04	0.04	0.56	0.06	4.00	4.65	100.02	0.9903
5	1142 WL-2-3-2.14M T85-2	12/4/84	76.97	12.69	1.06	0.03	0.05	0.56	0.06	3.96	4.63	100.01	0.9896
6	1418 BL-FSA-4 A112-9	10/23/85	76.83	12.79	1.08	0.04	0.04	0.56	0.06	3.96	4.65	100.00	0.9888
7	2562 SS-91-1-5 T232-6	8/7/91	76.97	12.65	1.08	0.03	0.03	0.54	0.07	3.98	4.65	100.01	0.9888
8	1684 SCHURZ-1 T134-6	11/25/86	77.01	12.64	1.09	0.03	0.05	0.55	0.05	3.94	4.64	100.00	0.9877
9	1409 KRL 82182 (A1) (599) T112-1	10/22/85	76.60	12.87	1.11	0.04	0.04	0.55	0.06	4.08	4.65	100.00	0.9862
10	2708 FLV-193-BC T246-2	12/12/91	76.75	12.61	1.16	0.04	0.06	0.56	0.06	3.91	4.65	100.00	0.9860
11	1680 KRL 86022 A T134-2	11/25/86	76.94	12.75	1.07	0.03	0.04	0.55	0.06	3.85	4.65	100.00	0.9859
12	1198 TULFAXE 2089 (50.32M) T90-14	3/1/85	76.94	12.69	1.08	0.07	0.04	0.57	0.11	3.89	4.61	99.99	0.9859
13	1245 WL 8-3A ASB B 59.5-64.0cm T93-	5/2/85	77.00	12.70	1.10	0.03	0.06	0.56	0.04	3.96	4.70	100.01	0.9852
14	1806 OD-XL-65CM T143-7	6/24/87	76.81	12.80	1.05	0.03	0.05	0.56	0.05	4.04	4.66	100.00	0.9850
15	2988 SS-91-4-2D	08/17/92	77.02	12.47	1.14	0.03	0.02	0.57	0.05	4.04	4.65	100.00	0.9843
16	2717 FLV-201-TO T249-5	1/30/92	76.85	12.77	1.10	0.02	0.04	0.54	0.04	3.99	4.64	99.98	0.9843
17	1291 WL 8-1B 192-194cm T99-3	07/01/85	76.95	12.70	1.11	0.03	0.06	0.56	0.04	3.80	4.64	100.00	0.9842
18	1686 291X86-1A T134-8	11/26/86	77.07	12.73	1.09	0.03	0.04	0.56	0.04	3.75	4.65	100.01	0.9840
19	1353 WL 8-2B 142-144.5 CM PLATY T99	7/1/85	77.23	12.59	1.09	0.03	0.05	0.56	0.07	3.91	4.71	100.01	0.9838
20	1310 WL 8-2B 172-174.5CM T99-10	7/1/85	76.90	12.74	1.05	0.02	0.05	0.56	0.06	4.05	4.72	99.99	0.9836
21	2820 JTB-SB-1 T226-6	5/24/92	76.70	12.80	1.06	0.04	0.04	0.54	0.06	3.95	4.65	100.01	0.9835
22	1224 WL CORE G 370cm T92-7	5/2/85	76.83	12.82	1.09	0.04	0.04	0.54	0.05	3.95	4.64	100.00	0.9834
23	1240 WL 4-2 3.29m T93-9	5/2/85	76.75	12.79	1.13	0.03	0.04	0.55	0.05	3.99	4.67	100.01	0.9833
24	1223 WL CORE G 180cm T92-6	5/2/85	76.64	12.88	1.11	0.04	0.05	0.57	0.06	3.99	4.67	100.01	0.9833
25	2557 SS-91-1-1 T232-2	6/8/91	76.57	12.92	1.07	0.02	0.04	0.54	0.06	4.05	4.72	99.99	0.9833

Date of Analysis: 08/17/92

SAMPLE ID: SS-91-4-2D

Recalculated to 100%

Raw Probe Data
(FeO to F₂O₃)

SiO ₂	75.270	SiO ₂	77.02
Al ₂ O ₃	12.187	Al ₂ O ₃	12.47
FeO	1.002*1.1113=Fe ₂ O ₃	Fe ₂ O ₃	1.14
MgO	0.031	MgO	0.03
MnO	0.023	MnO	0.02
CaO	0.557	CaO	0.57
TiO ₂	0.045	TiO ₂	0.05
Na ₂ O	3.947	Na ₂ O	4.04
K ₂ O	4.555	K ₂ O	4.66

TOTAL(R) 100.00

TOTAL(N) 97.727

TOTAL(O) 97.616

Listing of 50 closest matches for COMP. NO. 2988 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 08/21/92

C.No	Sample Number	Date	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	MgO	MnO	CaO	TiO ₂	Na ₂ O	K ₂ O	Total, R	Sim.	Co
1	2988 SS-91-4-2D	08/17/92	77.02	12.47	1.14	0.03	0.02	0.57	0.05	4.04	4.66	100.00	1.0000	
2	2708 FLV-193-BC T246-2	12/12/91	76.73	12.61	1.16	0.04	0.06	0.56	0.06	4.11	4.65	100.00	0.9886	
3	1223 WL CORE C 180cm T92-6	8/2/85	76.44	12.88	1.11	0.04	0.05	0.57	0.06	3.99	4.67	100.01	0.9871	
4	1240 WL 4-2 3.32m T93-9	5/2/85	76.73	12.79	1.13	0.03	0.04	0.55	0.05	4.02	4.64	100.00	0.9864	
5	788 GS-32		76.58	12.90	1.13	0.03	0.04	0.56	0.06	4.00	4.70	100.00	0.9860	
6	2969 SS-91-4-2C	08/17/92	76.97	12.56	1.08	0.02	0.02	0.56	0.04	4.08	4.65	99.98	0.9850	
7	2991 SS-91-4-5C	08/17/92	76.73	12.76	1.14	0.03	0.03	0.54	0.05	4.02	4.70	100.00	0.9846	
8	1293 WL 8-2A 92-94.5cm T99-5	07/01/85	77.03	12.56	1.13	0.03	0.05	0.56	0.06	3.86	4.62	100.00	0.9842	
9	1972 WL 4-58 (144.77m) T164-1	5/21/88	76.73	12.71	1.15	0.00	0.03	0.54	0.12	4.02	4.69	99.99	0.9841	
10	1292 WL 8-2A 2-4.5 cm T99-4	07/01/85	76.96	12.70	1.15	0.03	0.06	0.56	0.06	3.86	4.63	100.01	0.9840	
11	1191 TULULAKE 2038 (53.67M) T90-6	3/1/85	76.54	12.89	1.15	0.07	0.04	0.57	0.14	3.89	4.72	100.01	0.9838	
12	780 GS-21		76.41	13.12	1.13	0.03	0.05	0.58	0.06	4.01	4.61	100.00	0.9831	
13	1296 WL 8-2B142-144.5cm VESIC T99-8	07/01/85	77.02	12.66	1.16	0.03	0.07	0.57	0.08	3.76	4.65	100.00	0.9827	
14	1295 WL 8-2B 122-124.5cm T99-7	07/01/85	77.14	12.61	1.13	0.02	0.05	0.56	0.06	3.81	4.62	100.00	0.9826	
15	1241 WL 4-2 3.31m T93-10	5/2/85	76.69	12.91	1.14	0.04	0.04	0.55	0.06	3.92	4.67	100.02	0.9825	
16	2380 FLV-131-FC T203-4	4/16/90	77.18	12.43	1.12	0.01	0.04	0.54	0.06	3.93	4.68	99.99	0.9822	
17	551 KUL71082-J, T50-8	02/01/93	76.81	12.74	1.18	0.03	0.04	0.58	0.07	3.96	4.60	100.01	0.9820	
18	1409 KUL 82182 (Al) (599) T112-1	10/22/85	76.60	12.87	1.11	0.04	0.04	0.55	0.06	4.08	4.65	100.00	0.9817	
19	1291 WL 8-1B 192-194cm T99-3	07/01/85	76.95	12.70	1.13	0.03	0.06	0.56	0.07	3.86	4.64	99.98	0.9814	
20	2986 SS-91-3-3A	08/17/92	76.64	12.79	1.13	0.02	0.04	0.54	0.06	4.08	4.71	100.01	0.9813	
21	2999 SS-91-3-2D	08/17/92	76.61	12.80	1.15	0.04	0.05	0.54	0.05	4.06	4.73	100.00	0.9811	
22	1417 BL-RGA-3 T112-8	10/23/85	76.83	12.80	1.15	0.04	0.05	0.55	0.05	3.89	4.64	100.00	0.9810	
23	571 KUL91282F, T56-5	07/01/83	76.61	12.89	1.14	0.03	0.05	0.55	0.05	4.12	4.56	100.00	0.9809	
24	2721 FLV-199-BC T249-3	1/30/92	76.88	12.71	1.13	0.02	0.03	0.53	0.06	3.98	4.66	100.00	0.9809	
25	741 HC-1		76.76	12.83	1.11	0.02	0.03	0.50	0.06	3.91	4.71	100.01	0.9804	

Plot calcium vs iron for sample SS-91-4-3

Date of Analysis: 08/17/92

SAMPLE ID: SS-91-4-3A

Raw Probe Data Raw Probe Data Recalculated to 100%

(FeO to Fe2O3)

SiO2	73.254	SiO2	76.96
Al2O3	12.088	Al2O3	12.70
FeO	0.754*1.1113=Fe2O3	Fe2O3	0.88
MgO	0.028	MgO	0.03
MnO	0.036	MnO	0.04
CaO	0.494	CaO	0.52
TiO2	0.047	TiO2	0.05
Na2O	3.979	Na2O	4.18
K2O	4.424	K2O	4.65

TOTAL(R) 100.01

TOTAL(N) 95.189

TOTAL(O) 95.105

Listing of 50 closest matches for COMP. NO. 2970 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 08/21/92

C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total, R	Sim. Co
1	2970 SS-91-4-3A	08/17/92	76.96	12.70	0.88	0.03	0.04	0.52	0.05	4.18	4.65	100.01	1.0000
2	2975 SS-91-1-1A	08/17/92	76.75	12.90	0.90	0.03	0.07	0.51	0.05	4.07	4.73	100.01	0.9828
3	2016 KRL-82882-A T168-1	7/20/88	77.24	12.67	0.86	0.03	0.04	0.51	0.05	3.96	4.63	99.99	0.9025
4	3002 SS-91-4-2A	08/17/91	77.10	12.61	0.95	0.02	0.02	0.52	0.03	4.09	4.66	100.00	0.9823
5	2165 KRL-82982-B T178-1	12/6/88	77.36	12.71	0.97	0.01	0.05	0.52	0.04	3.81	4.63	100.00	0.9816
6	2954 SS-91-2-3B	08/17/92	77.04	12.71	0.94	0.01	0.04	0.51	0.05	4.13	4.57	100.00	0.9810
7	2170 KRL-82982-L T178-6	12/6/88	77.06	12.90	0.90	0.01	0.05	0.52	0.07	3.88	4.62	100.01	0.9805
8	2025 KRL-82882-F T168-10	7/20/88	77.46	12.28	0.86	0.03	0.05	0.50	0.05	4.11	4.68	100.02	0.9794
9	2989 SS-91-4-3B	08/17/92	77.09	12.63	0.97	0.02	0.03	0.52	0.05	4.08	4.61	100.00	0.9779
10	2024 KRL-82882-E T168-9	7/20/88	77.47	12.23	0.91	0.03	0.04	0.53	0.06	4.05	4.69	100.01	0.9775
11	2027 KRL-82882-G T168-12	7/20/88	77.67	12.16	0.97	0.02	0.04	0.50	0.05	4.03	4.65	99.99	0.9771
12	2162 FLV-2088-LC T250-6	2/26/92	76.84	12.64	0.98	0.02	0.04	0.52	0.04	4.29	4.63	100.00	0.9770
13	2028 KRL-82882-B T168-13	7/20/88	77.35	12.29	0.96	0.03	0.05	0.52	0.05	4.13	4.62	100.00	0.9768
14	2030 KRL-82882-K T168-15	7/20/88	77.14	12.53	0.94	0.03	0.05	0.52	0.05	4.00	4.73	99.99	0.9763
15	2026 KRL-82882-FWC T168-11	7/20/88	77.32	12.37	0.90	0.03	0.04	0.51	0.06	3.99	4.77	99.99	0.9762
16	2171 KRL-82982-M T178-7	12/6/88	77.04	12.92	0.91	0.00	0.05	0.52	0.05	3.82	4.70	100.01	0.9754
17	2966 SS-91-3-1A	08/17/92	77.12	12.53	0.85	0.03	0.02	0.49	0.08	4.11	4.77	100.00	0.9751
18	2029 KRL-82882-I T168-14	7/20/88	77.12	12.63	0.95	0.02	0.04	0.53	0.05	3.90	4.68	100.00	0.9743
19	3007 SS-91-1-8A	08/21/92	76.92	12.96	0.95	0.02	0.04	0.51	0.05	3.91	4.74	100.00	0.9738
20	2058 H88W-7 T170-5	9/3/88	77.13	12.78	0.96	0.04	0.05	0.55	0.08	4.02	4.49	100.00	0.9736
21	2161 FLV-2088-LC T250-5	2/26/92	76.75	12.77	0.97	0.02	0.04	0.51	0.04	4.33	4.58	100.01	0.9717
22	2194 FLV-107-TC T182-3	1/24/89	76.81	13.14	0.92	0.03	0.02	0.51	0.06	3.86	4.64	99.99	0.9705
23	3003 SS-91-4-4C	08/17/92	77.01	12.67	1.02	0.03	0.03	0.52	0.05	4.08	4.59	100.00	0.9705
24	2002 FLV-165-CH T255-5	4/15/92	76.64	13.03	0.92	0.02	0.06	0.49	0.08	4.04	4.72	100.00	0.9702
25	2960 SS-91-1-6A	08/17/92	76.66	13.06	0.93	0.03	0.05	0.52	0.06	3.90	4.79	99.99	0.9698

Date of Analysis: 08/17/92

SAMPLE ID: SS-91-4-3B

Recalculated to 100%

R. Probe Data
(FeO to Fe2O3)

Raw Probe Data

SiO2	73.948	SiO2	77.09
Al2O3	12.119	Al2O3	12.63
FeO	0.841*1.1113=Fe2O3	Fe2O3	0.97
MgO	0.022	MgO	0.02
MnO	0.029	MnO	0.03
CaO	0.495	CaO	0.52
TiO2	0.045	TiO2	0.05
Na2O	3.914	Na2O	4.08
K2O	4.422	K2O	4.61

TOTAL(R) 100.00

TOTAL(N) 95 928

TOTAL(O) 95.834

Listing of 50 closest matches for COMP. NO. 2989 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 08/21/92

C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total, R	Sim. Co
1	2989 SS-91-4-3B	08/17/92	77.09	12.63	0.97	0.02	0.03	0.52	0.05	4.08	4.61	100.00	1.0000
2	3002 SS-91-4-2A	08/17/91	77.10	12.61	0.95	0.02	0.02	0.52	0.03	4.09	4.66	100.00	0.9941
3	2028 KRL-82882-H T168-13	7/20/88	77.35	12.59	0.96	0.03	0.05	0.52	0.05	4.13	4.62	100.00	0.9909
4	3003 SS-91-4-4C	08/17/92	77.01	12.67	1.02	0.03	0.03	0.52	0.05	4.00	4.59	100.00	0.9901
5	2990 SS-91-4-4B	08/17/92	77.12	12.63	0.98	0.02	0.03	0.54	0.02	4.09	4.57	100.00	0.9902
6	2762 FLV-208B-LC T250-6	2/26/92	76.04	12.64	0.98	0.02	0.04	0.52	0.04	4.29	4.63	100.00	0.9887
7	1420 BL-RSA-6 T112-11	10/23/85	77.08	12.78	0.97	0.02	0.04	0.53	0.04	3.97	4.56	99.99	0.9886
8	2023 KRL-82882-H T174-2	10/6/88	77.27	12.68	0.97	0.02	0.04	0.52	0.05	3.82	4.63	100.00	0.9876
9	2954 SS-91-2-3B	08/17/92	77.04	12.71	0.94	0.01	0.04	0.51	0.05	4.13	4.57	100.00	0.9870
10	2959 SS-91-1-5A	08/17/92	76.66	13.08	0.97	0.02	0.05	0.51	0.04	4.03	4.64	100.00	0.9870
11	2029 KRL-82882-I T168-14	7/20/88	77.12	12.63	0.95	0.02	0.04	0.53	0.05	3.98	4.68	100.00	0.9868
12	679 KRL-82182(A-4), T66-3	10/25/83	76.09	12.92	1.02	0.02	0.05	0.52	0.04	4.08	4.55	99.99	0.9868
13	2030 KRL-82882-K T168-15	7/20/88	77.14	12.53	0.94	0.03	0.05	0.52	0.05	4.00	4.73	99.99	0.9859
14	2972 SS-91-4-4E	08/17/92	77.05	12.74	0.98	0.03	0.03	0.49	0.03	4.07	4.58	100.00	0.9857
15	3004 SS-91-3-2A	08/17/92	76.85	12.76	1.00	0.01	0.04	0.53	0.05	4.06	4.70	100.00	0.9856
16	2237 SL-262.5 T186-4	2/28/89	76.96	12.94	0.96	0.03	0.04	0.52	0.06	3.87	4.62	100.00	0.9851
17	1309 WL 8-7 T91-12	3/1/85	77.42	12.57	0.96	0.02	0.05	0.51	0.04	3.93	4.51	100.01	0.9838
18	2761 FLV-208A-LC T250-5	2/26/92	76.75	12.77	0.97	0.02	0.04	0.51	0.04	4.33	4.58	100.01	0.9835
19	1421 BL-RSA-7 T112-12	10/23/85	77.16	12.66	1.03	0.04	0.05	0.52	0.03	3.95	4.57	100.01	0.9830
20	3006 SS-91-4-2B	08/17/92	76.94	12.60	1.03	0.04	0.04	0.51	0.04	4.13	4.66	99.99	0.9826
21	2779 FLV-207-LC T252-6	3/10/92	77.22	12.60	1.01	0.01	0.05	0.52	0.06	3.95	4.56	99.97	0.9824
22	3008 SS-91-1-8B	08/21/92	76.71	12.96	0.98	0.02	0.06	0.52	0.06	3.93	4.75	99.99	0.9822
23	559 KRL82182(bubble wall), T56-4	07/01/83	76.87	12.92	1.01	0.02	0.03	0.53	0.03	4.03	4.55	99.99	0.9818
24	1246 WL 8-8 4.5-10cm T93-15	5/2/85	77.31	12.71	0.96	0.02	0.05	0.53	0.05	3.88	4.49	100.00	0.9811
25	2381 FLV-135-7C T203-5	4/16/90	77.64	12.17	1.00	0.01	0.04	0.51	0.06	3.99	4.58	100.00	0.9798

Plot calcium vs iron for sample SS-91-4-4

Date of Analysis: 08/17/92

SAMPLE ID: SS-91-4-4A

Recalculated to 100%

Raw Probe Data
(FeO to Fe2O3)

SiO2 76.83
Al2O3 12.83
Fe2O3 1.00
MgO 0.04
MnO 0.05
CaO 0.63
TiO2 0.05
Na2O 3.92
K2O 4.65

SiO2 73.561
Al2O3 12.286
FeO 0.864*1.1113=Fe2O3 0.961
MgO 0.037
MnO 0.051
CaO 0.601
TiO2 0.045
Na2O 3.751
K2O 4.457

TOTAL (R) 100.00

TOTAL (N) 95.750

TOTAL (O) 95.653

Listing of 50 closest matches for COMP. NO. 2971 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 08/21/92

C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total, R	Sim. Co
1	2971 SS-91-4-4A	08/17/92	76.83	12.83	1.00	0.04	0.05	0.63	0.05	3.92	4.65	100.00	1.0000
2	539 KRL7982-4L, T49-4	12/09/82	77.02	12.87	0.99	0.03	0.04	0.63	0.03	3.91	4.48	100.00	0.9909
3	2923 SS-91-4-4(42)	08/13/82	76.68	12.98	1.02	0.04	0.05	0.65	0.06	3.90	4.63	100.01	0.9878
4	544 KRL7982-14, T50-3	02/01/83	76.58	13.06	1.00	0.03	0.04	0.65	0.05	3.89	4.71	100.00	0.9876
5	2916 SS-91-4-4(6)	08/13/82	76.84	13.10	0.99	0.04	0.03	0.65	0.06	3.90	4.59	100.02	0.9859
6	948 DR-60		76.95	12.91	0.97	0.03	0.05	0.63	0.06	3.70	4.70	100.00	0.9826
7	543 KRL7982-8, 12/09/82	12/09/82	76.68	13.00	0.97	0.02	0.03	0.64	0.05	3.84	4.77	100.00	0.9823
8	180 KRL7982-11L, T44-8		76.76	13.01	0.92	0.02	0.03	0.63	0.04	3.89	4.70	100.00	0.9812
9	2918 SS-91-4-4(19)	08/13/82	76.98	12.65	1.04	0.03	0.07	0.66	0.01	3.89	4.68	100.01	0.9810
10	2712 FLV-197-BC, T246-6	12/12/91	76.46	12.98	0.98	0.04	0.05	0.65	0.06	4.02	4.77	100.01	0.9805
11	497 IV, T32-3		76.29	13.14	1.03	0.03	0.05	0.62	0.06	4.01	4.78	100.01	0.9791
12	542 KRL7982-7L, T49-7	12/09/82	76.73	12.94	1.04	0.03	0.02	0.61	0.06	3.82	4.76	100.01	0.9786
13	842 GS-88		76.75	12.91	1.07	0.03	0.04	0.64	0.06	3.80	4.70	100.00	0.9784
14	496 IIR-1, T32-2		76.70	13.13	0.99	0.03	0.05	0.65	0.05	3.69	4.72	100.01	0.9769
15	540 KRL7982-4U, T49-5	12/09/82	76.91	12.96	0.96	0.02	0.05	0.59	0.03	3.94	4.55	100.01	0.9765
16	179 KRL7982-11U, T45-1	12/09/82	76.81	12.97	0.95	0.03	0.03	0.60	0.05	3.04	4.72	100.00	0.9760
17	2107 KRL-82982-C, T174-11	10/28/88	76.88	12.80	1.00	0.03	0.05	0.56	0.07	3.84	4.69	100.00	0.9759
18	176 KRL7982-5, T44-5		76.67	12.93	0.98	0.03	0.04	0.60	0.05	3.83	4.87	100.00	0.9757
19	230 MONO-15, T40-3		76.86	12.90	0.91	0.04	0.03	0.63	0.07	3.81	4.76	100.01	0.9755
20	541 KRL7932-6, T49-6	12/09/82	76.75	12.87	0.96	0.03	0.04	0.65	0.06	3.80	4.86	100.02	0.9752
21	175 KRL7982-3, T44-4		76.72	12.95	0.94	0.01	0.04	0.60	0.04	4.04	4.66	100.00	0.9750
22	2607 LY-C-510, T232-7	8/15/91	77.08	12.76	1.00	0.04	0.05	0.57	0.06	3.76	4.68	100.00	0.9748
23	2715 FLV-198-BC, T249-2	1/30/92	76.82	12.82	0.97	0.01	0.04	0.59	0.06	3.85	4.84	100.00	0.9747
24	2097 KRL-82982-OR, T174-6	10/6/88	77.14	12.74	1.00	0.02	0.04	0.56	0.04	3.80	4.65	99.99	0.9745
25	1705 1986-122, T135-9	1/16/87	76.92	12.94	1.03	0.08	0.05	0.60	0.11	3.81	4.47	100.01	0.9745

Date of Analysis: 08/17/92

SAMPLE ID: SS-91-4-4B

Recalculated to 100%

Raw Probe Data
(FeO to Fe2O3)

SiO2	77.12
Al2O3	12.63
Fe2O3	0.98
MgO	0.02
MnO	0.03
CaO	0.54
TiO2	0.02
Na2O	4.09
K2O	4.57

TOTAL(R) 100.00

TOTAL(N) 97.537

TOTAL(O) 97.441

Listing of 50 closest matches for COMP. NO. 2990 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 08/21/92

C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total, R	Sim. Co
1	2990 SS-91-4-4B	08/17/92	77.12	12.63	0.98	0.02	0.03	0.54	0.02	4.09	4.57	100.00	1.0000
2	2989 SS-91-4-3B	08/17/92	77.09	12.63	0.97	0.02	0.03	0.52	0.05	4.08	4.61	100.00	0.9902
3	1420 BL-R3A-6 T112-11	10/23/85	77.08	12.78	0.97	0.02	0.04	0.53	0.04	3.97	4.56	99.99	0.9879
4	2843 JB-S3-16 T241-7	10/21/91	76.97	12.59	1.04	0.02	0.08	0.54	0.05	4.13	4.58	100.00	0.9876
5	3004 SS-91-3-2A	08/17/92	76.85	12.76	1.00	0.01	0.04	0.53	0.05	4.06	4.70	100.00	0.9855
6	3003 SS-91-4-4C	08/17/92	77.01	12.67	1.02	0.03	0.03	0.52	0.05	4.08	4.59	100.00	0.9854
7	3002 SS-91-4-2A	08/17/91	77.10	12.61	0.95	0.02	0.02	0.52	0.03	4.09	4.66	100.00	0.9852
8	559 KRL82182(bubble wall), T56-4	07/01/83	76.87	12.92	1.01	0.02	0.03	0.53	0.03	4.03	4.55	99.99	0.9845
9	2029 KRL-82802-Y T160-14	7/20/80	77.12	12.63	0.95	0.02	0.04	0.53	0.05	3.98	4.68	100.00	0.9834
10	679 KRL-82182(A-4), T66-3	10/25/83	76.89	12.82	1.02	0.02	0.05	0.52	0.04	4.08	4.55	99.99	0.9832
11	2762 FLV-200B-LC T250-6	2/26/92	76.84	12.64	0.98	0.02	0.04	0.52	0.04	4.29	4.63	100.00	0.9832
12	2984 SS-91-3-1B	08/17/92	76.95	12.54	1.00	0.02	0.04	0.53	0.06	4.31	4.56	100.01	0.9832
13	554 KRL82182(A-3), T56-4	07/01/83	76.97	12.82	1.02	0.03	0.03	0.55	0.04	4.09	4.44	99.99	0.9829
14	1681 KRL-86022-B T134-3	11/25/86	77.26	12.70	0.97	0.03	0.04	0.55	0.04	3.82	4.59	100.00	0.9823
15	2174 KRL-82902-O (MIN-1) T178-9	12/6/88	76.72	13.16	0.97	0.02	0.00	0.55	0.02	3.97	4.59	100.00	0.9821
16	2028 KRL-82802-B T168-13	7/20/88	77.35	12.29	0.96	0.03	0.05	0.52	0.05	4.13	4.62	100.00	0.9820
17	2072 SS-91-4-4E	08/17/92	77.05	12.74	0.98	0.03	0.03	0.49	0.03	4.07	4.58	100.00	0.9818
18	2954 SS-91-2-3R	08/17/92	77.04	12.71	0.96	0.01	0.04	0.51	0.05	4.13	4.57	100.00	0.9811
19	1246 WL B-8 4.5-10cm T93-15	5/2/85	77.31	12.71	0.96	0.02	0.05	0.53	0.05	3.88	4.49	100.00	0.9806
20	2707 FLV-192-BC T246-1	12/12/91	77.01	12.55	1.00	0.03	0.05	0.53	0.05	4.18	4.56	100.01	0.9806
21	2973 SS-91-4-5B	08/17/92	76.92	12.75	1.06	0.04	0.04	0.53	0.06	4.05	4.58	100.03	0.9803
22	2955 SS-91-280A	08/17/92	76.73	12.64	1.03	0.03	0.04	0.54	0.06	4.31	4.63	100.01	0.9803
23	2559 SS-91-1-2 T232-3	8/7/91	77.11	12.63	1.03	0.02	0.05	0.54	0.06	3.89	4.67	100.01	0.9802
24	435 3-30-82-1, T43-3		76.62	12.93	1.06	0.03	0.05	0.54	0.07	4.13	4.59	100.01	0.9801
25	1421 BL-R3A-7 T112-12	10/23/85	77.16	12.66	1.03	0.04	0.05	0.52	0.03	3.95	4.57	100.01	0.9796

Date of Analysis: 08/17/92

SAMPLE ID: SS-91-4-4D

Recalculated to 100%

Raw Probe Data
(FeO to Fe2O3)

SiO2	73.910	SiO2	76.75
Al2O3	12.339	Al2O3	12.81
FeO	0.965*1.1113=Fe2O3	Fe2O3	1.11
MgO	0.030	MgO	0.03
MnO	0.018	MnO	0.02
CaO	0.503	CaO	0.52
TiO2	0.052	TiO2	0.05
Na2O	3.916	Na2O	4.07
K2O	4.463	K2O	4.63

TOTAL(O) 96.196 TOTAL(N) 96.303 TOTAL(R) 99.99

Listing of 50 closest matches for COMP. NO. 2957 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 08/21/92

C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total, R	Sim. Co
1	2957 SS-91-4-4D	08/17/92	76.75	12.81	1.11	0.03	0.02	0.52	0.05	4.07	4.63	99.99	1.0000
2	561 KRL82282A, T66-5	10/25/83	76.71	12.80	1.12	0.04	0.05	0.52	0.06	3.98	4.65	100.01	0.9931
3	2716 FLV-200-LC T249-4	1/30/92	76.77	12.80	1.11	0.02	0.04	0.53	0.06	4.01	4.67	100.01	0.9928
4	2060 FLV-64-CS T170-7	9/3/88	76.71	12.87	1.11	0.02	0.04	0.54	0.04	4.02	4.64	99.99	0.9906
5	2979 SS-91-1-5B	08/17/92	76.42	13.14	1.09	0.03	0.05	0.52	0.05	4.04	4.66	100.00	0.9898
6	2993 SS-91-1-1B	08/17/92	76.49	12.92	1.10	0.02	0.07	0.53	0.05	4.11	4.70	99.99	0.9893
7	2921 JB-B5-2 T226-7	6/24/92	76.56	12.91	1.12	0.02	0.04	0.53	0.08	4.04	4.72	100.02	0.9893
8	1409 FOL 82182 (A1) (599) T112-1	10/22/85	76.60	12.87	1.11	0.04	0.04	0.55	0.06	4.08	4.65	100.00	0.9887
9	431 FOS-1, T13-1	10/22/85	76.61	12.93	1.12	0.03	0.05	0.54	0.07	4.03	4.64	100.02	0.9885
10	2995 SS-91-1-3B	08/17/92	76.71	12.69	1.09	0.02	0.05	0.52	0.04	4.17	4.72	100.01	0.9882
11	2639 JB-B5-12 T241-3	10/21/91	76.51	12.85	1.11	0.03	0.08	0.54	0.05	4.16	4.67	100.00	0.9878
12	2985 SS-91-3-2C	08/17/92	76.50	12.87	1.10	0.01	0.05	0.54	0.06	4.07	4.73	100.01	0.9877
13	2717 FLV-201-TO T249-5	1/30/92	76.85	12.77	1.10	0.02	0.04	0.54	0.04	3.99	4.65	100.00	0.9876
14	2721 FLV-199-BC T249-3	1/30/92	76.88	12.71	1.13	0.02	0.03	0.53	0.06	3.98	4.66	100.00	0.9876
15	567 KRL91882-K-1, T64-13	09/06/83	76.93	12.82	1.11	0.01	0.05	0.53	0.07	3.88	4.60	100.00	0.9875
16	437 6A, T35-7	08/17/92	75.81	12.97	1.11	0.03	0.03	0.52	0.06	3.92	4.56	99.01	0.9872
17	2986 SS-91-3-3A	08/17/92	76.64	12.79	1.13	0.02	0.04	0.54	0.06	4.08	4.71	100.01	0.9871
18	971 DR-85		76.75	12.93	1.14	0.03	0.05	0.52	0.07	3.91	4.61	100.01	0.9868
19	192 LD-12, T3, 4		76.75	12.93	1.14	0.03	0.05	0.52	0.07	3.91	4.61	100.01	0.9866
20	701 LD-12		76.94	12.70	1.12	0.03	0.07	0.53	0.07	3.91	4.61	100.00	0.9865
21	3001 SS-91-4-1A		76.94	12.72	1.12	0.03	0.07	0.53	0.07	3.91	4.61	100.00	0.9865
22	566 KRL91882B, T64-12	08/17/92	76.70	12.81	1.12	0.02	0.04	0.54	0.05	4.08	4.75	100.02	0.9864
23	2638 JB-B5-11 T241-2	09/06/83	76.81	12.82	1.10	0.01	0.05	0.53	0.08	3.91	4.69	100.00	0.9864
24	760 BO-16	10/21/91	76.55	12.92	1.11	0.02	0.08	0.54	0.06	4.16	4.68	99.99	0.9864
25	757 BO-7		76.59	12.92	1.11	0.03	0.03	0.54	0.07	4.00	4.71	100.00	0.9864
			76.35	13.23	1.14	0.03	0.03	0.52	0.09	4.01	4.61	100.01	0.9863

Plot of calcium vs iron for sample SS-91-4-5

SAMPLE ID: SS-91-4-5A

Date of Analysis: 08/17/92

Raw Probe Data

Raw Probe Data
(FeO to Fe2O3)

Recalculated to 100%

SiO2	72.821	SiO2	76.45
Al2O3	12.464	Al2O3	13.09
FeO	0.784*1.1113=Fe2O3	Fe2O3	0.91
MgO	0.039	MgO	0.04
MnO	0.029	MnO	0.03
CaO	0.657	CaO	0.69
TiO2	0.069	TiO2	0.07
Na2O	3.751	Na2O	3.94
K2O	4.551	K2O	4.78

TOTAL (O) 95.165 TOTAL (N) 95.253 TOTAL (R) 100.00

Listing of 50 closest matches for COMP. NO. 2958 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 08/21/92

C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total	R	Sim.	Co
1	2958 SS-91-4-5A	08/17/92	76.45	13.09	0.91	0.04	0.03	0.69	0.07	3.94	4.78	100.00	0.9830	1.0000	
2	2945 SS-91-4-5(43)	08/13/92	76.60	12.91	0.91	0.06	0.05	0.68	0.08	3.96	4.75	100.00	0.9931		
3	2941 SS-91-4-5(15)	08/13/92	76.34	13.25	0.90	0.03	0.03	0.70	0.07	3.95	4.73	100.00	0.9914		
4	2940 SS-91-4-5(77)	08/13/92	76.31	13.15	0.92	0.02	0.04	0.71	0.11	3.93	4.82	100.01	0.9906		
5	2946 SS-91-4-5(47)	08/13/92	76.55	13.03	0.93	0.04	0.00	0.68	0.04	3.91	4.82	100.00	0.9904		
6	2711 FLV-196-BC T246-5	12/12/91	76.65	12.88	0.90	0.05	0.04	0.67	0.08	3.95	4.78	100.00	0.9898		
7	2909 SS-91-4-2(39)	08/13/92	76.57	12.86	0.92	0.10	0.05	0.70	0.03	3.93	4.85	100.01	0.9898		
8	191 LD-10, T40-2	08/13/92	76.71	13.04	0.91	0.04	0.03	0.68	0.07	3.80	4.71	99.99	0.9880		
9	2924 SS-91-1-2(16)	08/13/92	76.54	12.93	0.92	0.04	0.05	0.67	0.02	4.00	4.83	100.00	0.9869		
10	574 KSL92082-A, T53-3	03/25/83	76.12	13.32	0.94	0.04	0.04	0.67	0.06	3.95	4.86	100.00	0.9831		
11	756 DO-5	08/17/92	76.29	13.42	0.90	0.04	0.06	0.70	0.08	3.80	4.71	100.00	0.9830		
12	2997 SS-91-2-3A	08/17/92	76.52	12.95	0.90	0.03	0.04	0.66	0.03	4.07	4.80	100.00	0.9830		
13	2709 FLV-194-NC T246-3	12/12/91	76.50	12.97	0.88	0.05	0.05	0.72	0.06	4.00	4.75	99.98	0.9824		
14	2976 SS-91-1-2A	08/17/92	76.49	13.01	0.88	0.05	0.08	0.66	0.05	4.02	4.76	100.00	0.9821		
15	545 KSL7982-17, T50-4	02/01/83	76.61	13.14	0.87	0.03	0.04	0.68	0.05	3.77	4.79	99.98	0.9817		
16	1136 WT-5-13-1.11M T84-12	12/3/84	76.59	13.09	0.89	0.04	0.06	0.71	0.07	3.74	4.82	100.01	0.9815		
17	2944 SS-91-4-5(38)	08/13/92	77.06	12.60	0.90	0.05	0.07	0.70	0.07	3.85	4.69	99.99	0.9813		
18	2950 SS-91-3-2(50)	08/13/92	76.56	13.05	0.92	0.04	0.00	0.71	0.07	4.06	4.59	100.00	0.9812		
19	2952 SS-91-1-8(48)	08/13/92	76.55	13.06	0.90	0.07	0.07	0.66	0.07	3.78	4.85	100.01	0.9811		
20	2913 SS-91-4-3(19)	08/13/92	76.73	12.74	0.89	0.05	0.02	0.71	0.08	3.90	4.89	100.01	0.9811		
21	495 IIB, T32-1	08/13/92	76.58	13.16	0.87	0.03	0.06	0.71	0.05	3.87	4.68	100.01	0.9804		
22	1919 WT-5-12 (61.28m) T164-8	5/22/88	76.51	13.26	0.87	0.04	0.05	0.70	0.07	3.76	4.75	100.01	0.9794		
23	455 679-409-6, T31-1	08/13/92	76.71	13.04	0.88	0.03	0.03	0.66	0.07	3.78	4.80	100.00	0.9786		
24	2921 SS-91-4-4(36)	08/13/92	76.88	12.80	0.87	0.07	0.02	0.66	0.06	3.93	4.72	100.01	0.9783		
25	573 KSL91982-K, T64-15	09/06/83	76.84	13.01	0.90	0.02	0.05	0.66	0.06	3.70	4.75	99.99	0.9779		

SAMPLE ID: SS-91-4-5B

Date of Analysis: 08/17/92

Raw Probe Data
Raw Probe Data
(FeO to Fe2O3)

Recalculated to 100%

SiO2	75.296	SiO2	76.92
Al2O3	12.477	Al2O3	12.75
FeO	0.931*1.1113=Fe2O3	Fe2O3	1.06
MgO	0.035	MgO	0.04
MnO	0.035	MnO	0.04
CaO	0.552	CaO	0.56
TiO2	0.054	TiO2	0.06
Na2O	3.965	Na2O	4.05
K2O	4.481	K2O	4.58

TOTAL(O) 97.789 TOTAL(N) 97.593 TOTAL(R) 100.06

Listing of 50 closest matches for COMP. NO. 2973 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 08/21/92

C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total, R	Sim. Co
1	2973 SS-91-4-5B	08/17/92	76.92	12.75	1.06	0.04	0.04	0.53	0.06	4.05	4.58	100.03	1.0000
2	2561 SS-91-1-4 T223-5	8/7/91	77.02	12.63	1.06	0.02	0.04	0.53	0.06	4.00	4.63	99.99	0.9944
3	2820 JB-B9-1 T226-6	6/24/92	76.70	12.80	1.06	0.02	0.04	0.54	0.06	4.05	4.72	99.99	0.9908
4	2560 SS-91-1-3 T232-4	8/7/91	77.08	12.64	1.06	0.02	0.05	0.53	0.06	3.92	4.64	100.00	0.9907
5	435 3-30-82-1, T43-3		76.62	12.93	1.06	0.02	0.05	0.54	0.07	4.13	4.59	100.01	0.9904
6	2707 FLV-192-BC T246-1	12/12/91	77.01	12.55	1.05	0.03	0.05	0.53	0.05	4.18	4.56	100.01	0.9897
7	564 KUL82782A, T64-11	09/06/83	76.99	12.75	1.09	0.01	0.06	0.53	0.08	3.90	4.59	100.00	0.9887
8	2496 FLV-159-CH T219-6	12/20/90	77.01	12.76	1.08	0.03	0.03	0.54	0.05	3.94	4.57	100.01	0.9886
9	2645 JB-WA-1 T242-1	10/21/91	76.77	12.70	1.09	0.02	0.07	0.53	0.06	4.19	4.57	100.00	0.9885
10	2643 JB-B9-16 T241-7	10/21/91	76.97	12.59	1.04	0.02	0.08	0.54	0.05	4.13	4.58	100.00	0.9883
11	559 KUL82182 (bubble wall), T56-4	07/01/83	76.87	12.92	1.01	0.02	0.03	0.53	0.03	4.03	4.55	99.99	0.9879
12	3003 SS-91-1-1 T232-2	08/17/92	77.01	12.67	1.02	0.03	0.03	0.52	0.05	4.08	4.59	100.00	0.9877
13	2557 SS-91-1-1 T232-2	6/8/91	76.57	12.92	1.07	0.02	0.04	0.54	0.06	4.05	4.72	99.99	0.9875
14	679 KUL-82182(A-4), T66-3	10/25/83	76.99	12.82	1.02	0.02	0.05	0.52	0.04	4.08	4.55	99.99	0.9873
15	2562 SS-91-1-5 T232-6	8/7/91	76.97	12.65	1.08	0.03	0.04	0.54	0.07	3.90	4.65	100.01	0.9870
16	2716 FLV-200-LC T249-4	1/30/92	76.77	12.80	1.11	0.02	0.04	0.53	0.06	4.01	4.67	100.01	0.9867
17	1025 KUL-71082C (390) T58-1	6/22/84	76.91	12.71	1.08	0.02	0.00	0.53	0.05	3.95	4.74	99.99	0.9866
18	570 KUL91982D, T66-10	xx/xx/83	76.81	12.89	1.08	0.03	0.05	0.53	0.06	3.90	4.65	100.00	0.9862
19	1421 BL-RSA-7 T112-12	10/23/85	77.16	12.66	1.03	0.04	0.05	0.52	0.03	3.95	4.57	100.01	0.9860
20	1225 WL-CORE G 380cm T92-8	5/2/85	76.82	12.79	1.06	0.04	0.04	0.56	0.06	4.00	4.65	100.02	0.9858
21	3004 SS-91-3-2A	08/17/92	76.85	12.76	1.00	0.01	0.04	0.53	0.05	4.06	4.70	100.00	0.9856
22	2957 SS-91-4-4D	08/17/92	76.75	12.81	1.11	0.03	0.02	0.52	0.05	4.07	4.63	99.99	0.9856
23	1419 BL-RSA-5 T112-10	10/23/85	76.98	12.65	1.09	0.04	0.04	0.53	0.05	3.93	4.68	99.99	0.9855
24	2717 FLV-201-TO T249-5	1/30/92	76.85	12.77	1.10	0.02	0.04	0.54	0.04	3.99	4.65	100.00	0.9853
25	2563 SS-91-1-Adges	8/7/91	76.73	12.85	1.04	0.03	0.05	0.53	0.07	3.95	4.74	99.99	0.9854

SAMPLE ID: SS-91-4-5C

Date of Analysis: 08/17/92

Recalculated to 100%

Raw Probe Data
(FeO to Fe2O3)

SiO2	73.049	SiO2	76.76
Al2O3	12.149	Al2O3	12.77
FeO	0.981*1.1113=Fe2O3	Fe2O3	1.15
MgO	0.032	MgO	0.03
MnO	0.033	MnO	0.03
CaO	0.510	CaO	0.54
TiO2	0.000	TiO2	0.00
Na2O	3.826	Na2O	4.02
K2O	4.472	K2O	4.70

TOTAL (R) 100.00

TOTAL (N) 95.166

TOTAL (O) 95.057

Listing of 50 closest matches for COWP. NO. 2991 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 08/21/92

C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total	R	Sim.	Co
1	2991 SS-91-4-5C	08/17/92	76.73	12.76	1.14	0.03	0.03	0.54	0.05	4.02	4.70	100.00	1.0000		
2	1972 WL-4-58 (144.77m) T164-1	5/21/88	76.73	12.71	1.15	0.00	0.03	0.54	0.12	4.02	4.69	99.99	0.9975		
3	2986 SS-91-3-3A	08/17/92	76.64	12.79	1.13	0.02	0.04	0.54	0.06	4.08	4.71	100.01	0.9951		
4	2999 SS-91-3-2D	08/17/92	76.61	12.80	1.13	0.01	0.05	0.54	0.05	4.06	4.73	100.00	0.9951		
5	1240 WL 4-2 3.29m T93-9	5/2/85	76.75	12.79	1.13	0.03	0.04	0.55	0.05	4.02	4.64	100.00	0.9929		
6	3001 SS-91-4-1A	08/17/92	76.70	12.72	1.12	0.02	0.04	0.54	0.05	4.08	4.73	100.02	0.9933		
7	431 Y09-1, T13-1		76.61	12.93	1.12	0.03	0.05	0.54	0.07	4.03	4.64	100.02	0.9921		
8	760 BO-16		76.59	12.92	1.11	0.03	0.03	0.54	0.04	4.00	4.71	100.00	0.9921		
9	2060 FLV-64-CS T170-7	9/3/88	76.71	12.87	1.11	0.02	0.04	0.54	0.04	4.02	4.64	99.99	0.9920		
10	2721 FLV-199-BC T249-3	1/30/92	76.88	12.71	1.13	0.02	0.03	0.53	0.06	3.98	4.66	100.00	0.9914		
11	2717 FLV-201-TO T249-5	1/30/92	76.85	12.77	1.10	0.02	0.04	0.54	0.04	3.99	4.65	100.00	0.9907		
12	2716 FLV-200-LC T249-4	1/30/92	76.77	12.80	1.11	0.02	0.04	0.53	0.06	4.01	4.67	100.01	0.9904		
13	2974 SS-91-4-SUA	08/17/92	76.60	12.86	1.10	0.02	0.05	0.54	0.06	4.04	4.74	100.01	0.9903		
14	2821 JB-B9-2 T226-7	6/24/92	76.56	12.91	1.12	0.02	0.04	0.53	0.08	4.04	4.72	100.02	0.9902		
15	1416 BL-R9A-2 T112-7	10/23/85	76.78	12.85	1.12	0.04	0.03	0.54	0.06	3.90	4.68	100.00	0.9901		
16	550 KSL82282, T66-4	xx/xx/83	76.74	12.90	1.13	0.02	0.06	0.54	0.06	3.97	4.68	100.00	0.9898		
17	1241 WL 4-2 3.31m T93-10	5/2/85	76.69	12.91	1.14	0.04	0.04	0.55	0.06	3.92	4.67	100.02	0.9897		
18	788 GS-32		76.58	12.90	1.13	0.03	0.04	0.56	0.06	4.00	4.70	100.00	0.9896		
19	2985 SS-91-3-2C	08/17/92	76.58	12.87	1.10	0.01	0.05	0.54	0.06	4.07	4.73	100.01	0.9893		
20	1029 KRL-99182K-1P (595) T58-6	6/22/84	76.79	12.72	1.13	0.03	0.00	0.54	0.05	3.91	4.83	100.00	0.9888		
21	2962 SS-91-1-SUB	08/17/92	76.26	12.99	1.14	0.04	0.05	0.54	0.08	4.15	4.76	100.01	0.9887		
22	2869 SS-91-3-2(14)	08/12/92	76.75	12.68	1.20	0.04	0.05	0.54	0.03	3.99	4.72	100.00	0.9886		
23	750 HC-10		76.27	13.21	1.15	0.03	0.03	0.53	0.07	4.00	4.70	99.99	0.9880		
24	750 BO-11		76.35	13.11	1.12	0.03	0.04	0.55	0.09	4.00	4.70	99.99	0.9879		
25	2992 SS-91-4-SUB	08/17/92	76.58	12.86	1.19	0.03	0.06	0.53	0.05	4.01	4.70	100.01	0.9879		

APPENDIX B
HIGH Ca GROUP

The number in parenthesis following the sample identification refers to the original unedited EMA output which for brevity have not been included.

SS-91-1-2(6): Correlates with: 6) KRL92082-A (S.C. 0.9875) from the Carson Sink, dated at ~28,000 y BP; 12) KRL7982-11L (S.C. 0.9795) from Wilson Creek dated at ~26,150 y BP; 16) KRL880-604B (S.C. 0.9784) from the Carson Sink dated at ~26,140 y BP; and, WL-4-12 (31.81m) (S.C. 0.9776) from a core of Walker Lake, dated at ~26,000 y BP. However, Ti and Mg display deviations.

SS-91-1-2(8): Good correlation with: 7) KRL92082-A (S.C. 0.9751) from the Carson Sink, dated at ~28,000 y BP; 11) KRL7932-6 (S.C. 0.9724) from Wilson Creek dated at ~21,490 y BP; and, KRL7982-14 (S.C. 0.9713) from Wilson Creek, dated at ~26,420 y BP.

SS-91-1-5(33): Correlates with: 4) KRL7982-16 (S.C. 0.9825) from Wilson Creek, dated at ~33,250 y BP; 7) KRL91982J (S.C. 0.9798) from South Shore Cliffs of Mono Lake, dated at ~33,250 y BP; and, 9) WL-5-5 (36.93m) (S.C. 0.9792), 10) WL-5-6 (39.31m) (S.C. 0.9787), 11) WL-5-6 (40.08m) (S.C. 0.9779), all tephra layers from Walker Lake ranging in age from ~34,000 to ~40,000 y BP.

SS-91-1-7(27): Strong correlation with: 2) KRL7982-17 (S.C. 0.9878) from Wilson Creek dated at ~34,0420 y BP; 4) WL-5-5 (36.93m) (S.C. 0.9862), 6) WL-5-6 (40.08m) (S.C. 0.9853), 8) WL-5-6 (39.31m) (S.C. 0.9828), 11) WL-4-13 (33.32m)

(S.C. 0.9803), and 12) WL-5-12 (61.28m), all from cores of Walker Lake ranging in age from ~28,000 to ~69,000 y BP.
SS-91-1-8(48): Good correlation with: 17) WL-5-6 (39.31m) (S.C. 0.9815), 23) WL-4-13 (33.32m) (S.C. 0.9793), and WL 2-7 20.39m (S.C. 0.9788). All the above tephra layers are from Walker Lake with ages ranging from ~17,000 to ~40,000 y BP.

SS-91-2-2B(50): Good correlation with: 2) KRL7982-16 (S.C. 0.9726) from Wilson Creek, dated at ~33,250 y BP.

SS-91-4-1(5): Correlates with: 5) WL-4-25 (62.76m) (Mg displays a slight deviation) from a core of Walker Lake, dated at ~72,000 y BP; 7) KRL7982-19B (S.C. 0.9714) from Wilson Creek, dated at ~35,800 y BP; and, 10) WL-5-13 (64.49m) from a core of Walker Lake, dated at ~73,000 y BP.

SS-91-4-1(33): Good correlation with: 8) KRL7982-14 (S.C. 0.9769); 11) KRL7982-7L (S.C. 0.9730); and, 17) KRL7982-8 (S.C. 0.9706). All of the above samples are from Wilson Creek with ages ranging from 21,690-26,420 y BP.

SS-91-4-2(41): Good correlation with: 2) KRL7982-17 (S.C. 0.9864) from Wilson Creek, dated at ~34,020 y BP; and, 22) KRL91982J (S.C. 0.9779) from South Shore Cliffs at Mono Lake, dated at ~33,250 y BP.

SS-91-4-3(15): Strong correlation with: 8) WL 4-26 66.87m (S.C. 0.9822); 9) WL 4-26 66.68m (S.C. 0.9820); 11) WL-5-12- (61.28m); 14) WL-4-26 66.33m (S.C. 0.9793); and, 18) WL-4-26 (66.50m) (S.C. 0.9772). All of the above tephra layers are from cores of Walker Lake, with ages ranging from ~73,000 to ~75,000 y BP.

SS-91-4-3(19): Good correlation with: 7) WL 4-26 66.87m (S.C. 0.9823); 11) WL 4-26 66.68m (S.C. 0.9809) (Mn displays

a slight deviation); 16) WL 4-26 (S.C. 0.9780). All of the above tephra layers are from cores of Walker Lake, with ages ranging from ~73,000 to ~75,000 y BP. Also correlates with; 21) KRL7982-19B (S.C. 0.9768) from Wilson Creek, dated at ~35,800 y BP.

SS-91-4-4(8): Good correlation with: 2) KRL7982-14 (S.C. 0.9930); 7) KRL7982-8 (S.C. 0.9843); and, 9) KRL7982-E (S.C. 0.9796). All of the above tephra layers are from Wilson Creek, with ages ranging from ~26,420 to ~30,000 y BP. However, Ti displays a slight variation in all of the above samples.

SS-91-4-4(42): Good correlation with: 2) KRL7982-14 (S.C. 0.9918), dated at ~26,420 y BP; and 8) KRL7982-8 (S.C. 0.9816), dated at ~25,310 y BP; and, 13) KRL7982-E (S.C. 0.9771), dated at ~30,000 y BP. All of the above samples are from Wilson Creek.

SS-91-4-5(5): Strong correlation with many tephra layers from cores of Walker Lake ranging in age from ~73,000 to ~84,000 y BP.

SS-91-4-5(7): Fairly good correlation with three tephra layers from cores of Walker Lake ranging in age from ~58,000 to ~73,000 y BP.

SS-91-4-5(15): Strong correlation with: 7) IIB (S.C. 0.9853) from Rush Creek, dated at ~35,800 y BP; 20) KRL92082-A (S.C. 0.9800) from the Carson Sink, dated at ~28,000 y BP and two other KRL samples from Wilson Creek of similar age. Additionally, correlates with two tephra layers from cores of Walker Lake dated at ~69,000 to ~73,000 y BP.

SS-91-4-5(20): Good correlation with several tephra layers from Walker Lake ranging in age from ~32,000 to ~73,000 y

BP. Also correlates with a tephra layer from Rush Creek 22) IIB (S.C. 0.9784), dated at 35,800 y BP. However, all of the above samples display a slight deviation in Ti.

SS-91-4-5(22): Strong correlation with: 7) KRL92082-A (S.C. 0.9846) from the Carson Sink, dated at ~28,000 y BP; 8) KRL7982-E (S.C. 0.9839) from Wilson Creek, dated at ~30,000 y BP; and, 14) WL-4-10 (23.25m) (S.C. 0.9792) from a core of Walker Lake, dated at ~21,000 y BP.

SS-91-4-5(38): Strong correlation with: 2) WL 4-26 66.87m (S.C. 0.9857); 13) WL 4-26 66.68m (S.C. 0.9799); 16) WL-5-12 (61.28m) (S.C. 0.9790); and, 23) WL-5-57 (144.14m) (S.C. 0.9753). All of the above tephra layers are from cores of Walker Lake and range in age from ~68,000 to ~180,000 y BP.

SS-91-4-5(47): Good correlation with: 6) KRL92082-A (S.C. 0.9882) from the Carson Sink, dated at ~28,000 y BP; 10) KRL 880-604B (S.C. 0.9830), 14) KRL7982-11L (S.C. 0.9802), 19) KRL7982-10 (S.C. 0.9787) all from Wilson Creek and dated at ~26,000 y BP. However, all of the above samples display a slight deviation in Mn.

Date of Analysis: 08/13/92

SAMPLE ID: SS-91-1-2(6)

Recalculated to 100%

Raw Probe Data
(FeO to Fe2O3)

SiO2 76.54
Al2O3 12.93
Fe2O3 0.92
MgO 0.04
MnO 0.05
CaO 0.67
TiO2 0.02
Na2O 4.00
K2O 4.83

TOTAL(R) 100.00

TOTAL(N) 3.176

TOTAL(O) 97.087

Listing of 50 closest matches for COMP. NO. 2924 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 08/17/92

C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	Ca	Fe	Na2O	K2O	Total, R	Sim. Co
1	2924 SS-91-1-2(6)	08/13/92	76.54	12.93	0.92	0.04	0.05	0.67	0.02	4.83	100.00	1.0000
2	2711 FLV-196-BC T246-5	12/12/91	76.55	12.88	0.90	0.05	0.04	0.67	0.08	4.78	100.00	0.9917
3	2945 SS-91-4-5(43)	08/13/92	76.60	12.91	0.91	0.06	0.05	0.68	0.08	4.75	100.00	0.9909
4	2946 SS-91-4-5(47)	08/13/92	76.55	13.03	0.93	0.04	0.00	0.60	0.04	4.82	100.00	0.9904
5	2909 SS-91-4-2(39)	08/13/92	76.57	12.86	0.92	0.10	0.05	0.70	0.03	4.05	100.01	0.9883
6	574 KRL2082-A, T53-3	03/25/83	76.12	13.32	0.94	0.04	0.04	0.67	0.06	4.86	100.00	0.9875
7	2940 SS-91-4-5(7)	08/13/92	76.31	13.15	0.92	0.02	0.04	0.71	0.11	3.93	100.01	0.9841
8	2952 SS-91-1-8(48)	08/13/92	76.55	13.06	0.90	0.07	0.07	0.66	0.07	3.78	100.01	0.9824
9	191 LD-10, T40-2	08/13/92	76.71	13.04	0.91	0.04	0.03	0.68	0.07	4.71	99.99	0.9815
10	2943 SS-91-4-5(22)	08/13/92	76.45	13.01	0.97	0.04	0.04	0.67	0.10	3.84	100.01	0.9811
11	2712 FLV-197-BC T246-6	12/12/91	76.46	12.98	0.98	0.04	0.05	0.65	0.06	4.02	100.01	0.9811
12	180 KRL7982-11L, T44-8	08/13/92	76.76	13.01	0.92	0.02	0.03	0.63	0.04	3.89	100.00	0.9795
13	695 RSC91	08/13/92	76.82	12.90	0.85	0.01	0.00	0.66	0.05	4.00	99.99	0.9794
14	2921 SS-91-4-4(36)	08/13/92	76.88	12.80	0.87	0.07	0.02	0.66	0.06	3.93	100.01	0.9793
15	2941 SS-91-4-5(15)	08/13/92	76.34	13.25	0.90	0.03	0.03	0.70	0.07	4.73	100.00	0.9792
16	2375 KRL880-504B, T201-5	10/12/99	76.67	13.17	0.93	0.02	0.03	0.66	0.04	3.69	100.01	0.9784
17	2950 SS-91-3-2(50)	08/13/92	76.56	13.05	0.92	0.04	0.04	0.71	0.07	4.06	100.00	0.9783
18	455 679-409-6, T31-1	12/12/91	76.50	12.97	0.88	0.03	0.03	0.66	0.07	3.78	100.00	0.9783
19	2709 FLV-194-BC T246-3	08/13/92	76.50	12.97	0.88	0.05	0.05	0.72	0.06	4.00	99.98	0.9776
20	1955 WL-4-12 (31.81M) T162-9	5/15/88	76.98	12.89	0.92	0.03	0.04	0.65	0.04	3.65	99.99	0.9776
21	541 KRL7932-6, T49-6	12/09/82	76.75	12.87	0.96	0.03	0.04	0.65	0.06	3.80	100.02	0.9775
22	2925 SS-91-1-2(8)	08/13/92	76.28	12.92	0.94	0.05	0.07	0.65	0.07	4.27	99.99	0.9771
23	573 KRL91982-K, T64-15	09/06/83	76.84	13.01	0.90	0.02	0.05	0.66	0.06	3.70	99.99	0.9768
24	230 MONO-15, T40-3	08/13/92	76.86	12.90	0.91	0.04	0.03	0.63	0.07	3.81	100.01	0.9768
25	2948 SS-91-1-7(27)	08/13/92	76.50	13.05	0.86	0.04	0.07	0.67	0.08	4.93	100.01	0.9762

Date of Analysis: 08/13/92

SAMPLE ID: SS-91-1-2(8)

Recalculated to 100%

Raw Probe Data
(F. to Fe2O3)

SiO2	74.338	SiO2	76.28
Al2O3	12.587	Al2O3	12.92
FeO	0.823*1.1113=Fe2O3	Fe2O3	0.94
MgO	0.051	MgO	0.05
MnO	0.069	MnO	0.07
CaO	0.635	CaO	0.65
TiO2	0.073	TiO2	0.07
Na2O	4.161	Na2O	4.27
K2O	4.621	K2O	4.74

TOTAL(O) 97.358 TOTAL 97.450 TOTAL(R) 99.99

Listing of 50 closest matches for COMP. NO. 2925 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 08/17/92

C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total, R	Sim. Co
1	2925 SS-91-1-2(8)	08/13/92	76.28	12.92	0.94	0.05	0.07	0.65	0.07	4.27	4.74	99.99	1.0000
2	2712 FLV-197-BC T246-6	12/12/91	76.46	12.98	0.98	0.04	0.05	0.65	0.06	4.02	4.77	100.01	0.9812
3	2924 SS-91-1-2(6)	08/13/92	76.54	12.93	0.92	0.04	0.05	0.67	0.02	4.00	4.83	100.00	0.9771
4	2935 SS-91-1-1(36)	08/13/92	76.31	13.22	0.91	0.06	0.06	0.67	0.03	4.23	4.51	100.00	0.9762
5	2945 SS-91-4-5(43)	08/13/92	76.60	12.91	0.91	0.06	0.05	0.68	0.00	3.96	4.75	100.00	0.9741
6	175 KRL7982-3, T44-4	08/13/92	76.72	12.95	0.94	0.01	0.04	0.60	0.04	4.04	4.66	100.00	0.9740
7	574 KRL92082-A, T53-3	03/25/83	76.12	13.32	0.94	0.04	0.04	0.67	0.06	3.95	4.86	100.00	0.9731
8	180 KRL7982-11L, T44-8	12/12/91	76.76	13.01	0.92	0.02	0.03	0.63	0.04	3.89	4.70	100.00	0.9729
9	2711 FLV-196-BC T246-5	12/12/91	76.65	12.88	0.90	0.05	0.04	0.67	0.08	3.95	4.78	100.00	0.9727
10	543 KRL7982-8, 12/09/82	12/09/82	76.68	13.00	0.97	0.02	0.03	0.64	0.05	3.84	4.77	100.00	0.9726
11	541 KRL7932-6, T49-6	12/09/82	76.75	12.87	0.96	0.03	0.04	0.65	0.06	3.80	4.86	100.02	0.9724
12	2946 SS-91-4-5(47)	08/13/92	76.55	13.03	0.93	0.04	0.00	0.68	0.04	3.91	4.82	100.00	0.9721
13	544 KRL7982-14, T50-3	02/01/83	76.58	13.06	1.00	0.03	0.04	0.65	0.05	3.88	4.71	100.00	0.9713
14	181 KRL7982-13, T45-2	08/13/92	76.49	13.18	0.94	0.03	0.03	0.60	0.06	3.94	4.73	100.00	0.9702
15	230 MONO-15, T40-3	5/15/88	76.86	12.90	0.91	0.04	0.03	0.63	0.07	3.81	4.76	100.01	0.9694
16	1955 WL-4-12 (31.81M) T162-9	08/13/92	76.98	12.89	0.92	0.03	0.04	0.65	0.04	3.65	4.79	99.99	0.9686
17	2916 SS-91-4-4(0)	08/13/92	76.64	13.10	0.99	0.04	0.03	0.65	0.09	3.89	4.59	100.02	0.9684
18	2921 SS-91-4-4(36)	08/13/92	76.88	12.80	0.87	0.07	0.02	0.66	0.06	3.93	4.72	100.01	0.9682
19	695 RSC31	08/13/92	76.82	12.90	0.85	0.01	0.00	0.66	0.05	4.00	4.70	99.99	0.9681
20	177 KRL7982-9, T44-6	08/13/92	76.78	12.89	0.94	0.03	0.02	0.59	0.06	3.92	4.70	100.01	0.9681
21	2923 SS-91-4-4(42)	08/13/92	76.68	12.98	1.02	0.04	0.05	0.65	0.06	3.90	4.63	100.01	0.9670
22	2375 KRL880-604B T201-5	10/12/89	76.67	13.17	0.93	0.02	0.03	0.66	0.04	3.69	4.80	100.01	0.9670
23	2934 SS-91-1-1(15)	08/13/92	76.33	12.95	1.10	0.06	0.03	0.66	0.03	4.14	4.72	100.02	0.9670
24	2950 SS-91-3-2(50)	08/13/92	76.56	13.05	0.92	0.04	0.00	0.71	0.07	4.06	4.59	100.00	0.9666
25	2943 SS-91-4-5(22)	08/13/92	76.45	13.01	0.97	0.04	0.04	0.67	0.10	3.84	4.89	100.01	0.9665

Date of Analysis: 08/13/92

SAMPLE ID: SS-91-1-5(33)

Recalculated to 100%

Raw Probe Data
(FeO to Fe2O3)

SiO2	72.880	SiO2	76.30
Al2O3	12.765	Al2O3	13.36
FeO	0.726*1.1113=Fe2O3	Fe2O3	0.84
MgO	0.040	MgO	0.04
MnO	0.051	MnO	0.05
CaO	0.618	CaO	0.65
TiO2	0.066	TiO2	0.07
Na2O	3.800	Na2O	3.98
K2O	4.487	K2O	4.70

TOTAL(R) 99.99

TOTAL(N) 95.513

TOTAL(O) 95.432

Listing of 30 closest matches for COMP. NO. 2931 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 08/17/92

C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	CaO	TiO2	Na2O	K2O	Total.R	Sim. Co
1	2931 SS-91-1-5(33)	08/13/92	76.30	13.36	0.84	0.04	0.05	0.65	0.07	3.98	4.70	99.99 1.0000
2	2947 SS-91-4-5(49)	08/13/92	76.63	13.06	0.83	0.01	0.01	0.65	0.00	3.99	4.81	99.99 0.9893
3	695 RSC91		76.82	12.90	0.85	0.01	0.00	0.66	0.05	4.00	4.70	99.99 0.9078
4	182 KRL7982-16, T45-3		76.66	13.17	0.83	0.03	0.02	0.68	0.07	3.91	4.64	100.01 0.9825
5	2644 JB-BE-17 T241-8	10/21/91	76.22	13.28	0.84	0.04	0.08	0.70	0.05	4.04	4.76	100.01 0.9023
6	2921 SS-91-4-4(36)	08/13/92	76.88	12.80	0.87	0.07	0.02	0.66	0.06	3.93	4.72	100.01 0.9807
7	572 KRL91982J, T64-14	09/06/83	76.90	12.98	0.83	0.02	0.05	0.67	0.06	3.85	4.65	100.01 0.9798
8	434 679-340, T31-2		76.57	13.20	0.84	0.03	0.03	0.70	0.07	3.84	4.71	99.99 0.9773
9	1974 WL-5-5 (36.93m) T164-3	5/21/88	76.69	13.09	0.83	0.03	0.05	0.66	0.06	3.79	4.82	100.02 0.9792
10	1975 WL-5-6 (39.23m) T164-4	5/21/88	76.69	13.10	0.82	0.04	0.05	0.66	0.07	3.79	4.78	100.00 0.9787
11	1976 WL-5-6 (40.08m) T164-5	5/21/88	76.68	13.08	0.82	0.03	0.05	0.66	0.06	3.91	4.82	100.01 0.9779
12	2559 JB-BG-6 T227-3	6/13/91	76.39	13.29	0.83	0.04	0.06	0.71	0.06	3.88	4.74	100.00 0.9773
13	2845 FLV-213-LC T261-2	7/14/92	76.14	13.26	0.84	0.04	0.06	0.71	0.05	4.11	4.79	100.00 0.9759
14	183 KRL7982-19B, T45-4		76.37	13.29	0.83	0.04	0.02	0.71	0.07	3.88	4.79	100.00 0.9756
15	2565 SS-91-1 High Ca SS	8/7/91	77.12	12.77	0.83	0.03	0.05	0.67	0.05	3.79	4.67	99.98 0.9749
16	2922 SS-91-4-4(38)	08/13/92	76.47	13.09	0.83	0.07	0.06	0.72	0.11	4.03	4.64	100.02 0.9739
17	2941 SS-91-4-5(15)	08/13/92	76.34	13.25	0.90	0.03	0.03	0.70	0.07	3.95	4.73	100.00 0.9732
18	455 679-409-6, T31-1		76.71	13.04	0.88	0.03	0.03	0.66	0.07	3.78	4.80	100.00 0.9712
19	2711 FLV-196-BC T246-5	12/12/91	76.65	12.88	0.90	0.03	0.04	0.67	0.08	3.95	4.78	100.00 0.9731
20	2926 SS-91-1-2(17)	08/13/92	76.77	12.98	0.79	0.07	0.13	0.67	0.03	3.84	4.72	100.00 0.9728
21	2942 SS-91-4-5(20)	08/13/92	76.67	12.97	0.82	0.04	0.03	0.70	0.03	3.93	4.81	100.00 0.9726
22	2938 SS-91-4-5(5)	08/13/92	76.41	13.19	0.84	0.03	0.03	0.76	0.08	3.96	4.71	100.01 0.9723
23	2948 SS-91-1-7(27)	08/13/92	76.50	13.05	0.86	0.04	0.07	0.67	0.08	3.81	4.93	100.01 0.9720
24	495 IIB, T32-1		76.58	13.16	0.87	0.03	0.06	0.71	0.05	3.87	4.68	100.01 0.9717
25	545 KRL7982-17, T50-4	02/01/83	76.61	13.14	0.87	0.03	0.04	0.68	0.05	3.77	4.79	99.98 0.9716

Date of Analysis: 08/13/92

SAMPLE ID: SS-91-1-7(27)

Recalculated to 100%

Raw Probe Data
(FeO to Fe2O3)

SiO2	73.602	SiO2	76.50
Al2O3	12.554	Al2O3	13.05
FeO	0.741*1.111=Fe2O3	Fe2O3	0.86
MgO	0.037	MgO	0.04
MnO	0.064	MnO	0.07
CaO	0.648	CaO	0.67
TiO2	0.077	TiO2	0.08
Na2O	3.663	Na2O	3.81
K2O	4.747	K2O	4.93

TOTAL(O) 96.131, TOTAL(N) 96.213, TOTAL(R) 100.01

Listing of 50 closest matches for COMP. NO. 2948 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 08/17/92

C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total	R	Sim.	Co
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1	2948	SS-91-1-7(27)	08/13/92	76.50	13.05	0.86	0.04	0.07	0.08	3.81	4.93	100.01	1.0000		
2	545	KSL7982-17, T50-4	02/01/83	76.61	13.14	0.87	0.03	0.03	0.03	3.77	4.79	99.98	0.9878		
3	455	679-409-6, T31-1	5/21/88	76.71	13.04	0.88	0.03	0.03	0.06	3.78	4.80	100.00	0.9874		
4	1974	WL-5-5 (34.82M), T164-3	08/13/92	76.59	13.09	0.83	0.03	0.05	0.06	3.79	4.82	100.02	0.9862		
5	2952	SS-91-1-8(48)	08/13/92	76.55	13.06	0.90	0.07	0.07	0.07	3.70	4.85	100.01	0.9859		
6	1976	WL-5-6 (40.08M), T164-5	5/21/88	76.68	13.08	0.82	0.03	0.05	0.06	3.81	4.82	100.01	0.9853		
7	2910	SS-91-4-2(41)	08/13/92	77.06	12.68	0.86	0.01	0.03	0.06	3.81	4.81	99.99	0.9852		
8	1975	WL-5-6 (39.31M), T164-4	5/21/88	76.69	13.10	0.82	0.04	0.05	0.07	3.79	4.78	100.00	0.9828		
9	572	KSL91982J, T64-14	09/06/83	76.90	12.98	0.83	0.02	0.03	0.06	3.85	4.65	100.01	0.9812		
10	1033	KSL-71082 (II-4) (593) T58-4	6/22/84	76.44	13.18	0.88	0.05	0.00	0.70	3.69	4.98	99.99	0.9804		
11	1956	WL-4-13 (33.32M), T162-10	5/15/88	76.38	12.91	0.86	0.04	0.04	0.65	3.60	4.85	99.99	0.9803		
12	1979	WL-5-12 (61.28M), T164-8	5/22/88	76.51	13.26	0.87	0.04	0.05	0.70	3.76	4.75	100.01	0.9800		
13	191	LD-10, T40-2	8/7/91	77.12	12.77	0.83	0.04	0.03	0.68	3.80	4.71	99.99	0.9799		
14	2565	SS-91-1 High Ca SS	08/13/92	76.98	12.80	0.87	0.03	0.05	0.67	3.79	4.67	99.98	0.9796		
15	2921	SS-91-4-4(36)	12/12/91	76.65	12.88	0.90	0.07	0.02	0.66	3.93	4.72	100.01	0.9794		
16	2711	FLV-196-BC T246-5	09/06/83	76.57	13.20	0.84	0.05	0.04	0.57	3.95	4.78	100.00	0.9791		
17	454	679-340, T31-2	08/13/92	76.84	13.01	0.90	0.03	0.03	0.70	3.84	4.71	99.99	0.9782		
18	573	KSL91982-K, T64-15	08/13/92	76.45	13.01	0.97	0.04	0.05	0.66	3.70	4.75	99.99	0.9780		
19	2943	SS-91-4-5(22)	12/3/84	76.59	13.09	0.89	0.04	0.06	0.67	3.84	4.89	100.01	0.9778		
20	1136	WL-5-13-1.11M T84-12	08/13/92	76.82	12.90	0.85	0.04	0.06	0.71	3.74	4.82	100.01	0.9775		
21	695	RSC31	08/13/92	76.63	13.06	0.83	0.01	0.00	0.66	4.00	4.70	99.99	0.9773		
22	2947	SS-91-4-5(49)	5/22/88	76.39	13.19	0.83	0.03	0.05	0.65	3.99	4.81	99.99	0.9772		
23	1982	WL-5-13 (64.49M) T164-11	5/15/88	77.01	12.97	0.82	0.04	0.04	0.67	3.73	4.80	99.99	0.9772		
24	1959	WL-4-18 (43.53M) T162-13	08/13/92	76.55	13.03	0.93	0.04	0.04	0.68	3.63	4.77	100.01	0.9768		
25	2946	SS-91-4-5(47)								3.91	4.82	100.00	0.9767		

Date of Analysis: 08/13/92

SAMPLE ID: SS-91-1-8(48)

Recalculated to 100%

Raw Probe Data
(FeO to Fe2O3)

SiO2	75.725	SiO2	76.55
Al2O3	12.922	Al2O3	13.06
FeO	0.797*1.1113=Fe2O3	Fe2O3	0.90
MgO	0.069	MgO	0.07
MnO	0.066	MnO	0.07
CaO	0.651	CaO	0.66
TiO2	0.070	TiO2	0.07
Na2O	3.738	Na2O	3.78
K2O	4.797	K2O	4.85

TOTAL(O) 98.834 TOTAL(N) 98.923 TOTAL(R) 100.01

Listing of 50 closest matches for COMP. NO. 2952 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 08/17/92

C.No Sample Number

C.No Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	CaO	Fe	MnO	TiO2	Na2O	K2O	Total, R Sim. Co
1 2952 SS-91-1-8(48)	08/13/92	76.55	13.06	0.90	0.07	0.66	0.07	0.07	0.66	3.78	4.85	100.01
2 455 679-409-6, T31-1		76.71	13.04	0.88	0.03	0.66	0.07	0.07	0.66	3.78	4.80	100.00
3 573 KRL91982-K, T64-15	09/06/83	76.84	13.01	0.90	0.02	0.66	0.06	0.06	0.66	3.70	4.75	99.99
4 2375 KRL890-604B, T201-5	10/12/89	76.67	13.17	0.93	0.02	0.66	0.04	0.04	0.66	3.69	4.00	100.01
5 191 LD-10, T40-2		76.71	13.04	0.91	0.04	0.68	0.07	0.07	0.68	3.80	4.71	99.99
6 545 KRL7982-17, T50-4	02/01/83	76.61	13.14	0.87	0.03	0.68	0.05	0.05	0.68	3.77	4.79	99.98
7 2948 SS-91-1-7(27)	08/13/92	76.50	13.05	0.86	0.04	0.67	0.08	0.08	0.67	3.81	4.93	100.01
8 2711 FLV-196-BC, T246-5	12/12/91	76.65	12.88	0.90	0.05	0.66	0.06	0.06	0.66	3.95	4.78	100.00
9 1974 WL-5-5 (36.93m), T164-3	5/21/88	76.69	13.09	0.93	0.03	0.66	0.06	0.06	0.66	3.79	4.82	100.02
10 230 MNO-15, T40-3		76.86	12.90	0.91	0.04	0.63	0.07	0.07	0.63	3.81	4.76	100.01
11 1136 WL-5-13-1.11M, T84-12	12/3/84	76.59	13.09	0.89	0.04	0.71	0.07	0.07	0.71	4.82	100.01	0.98331
12 541 KRL7932-6, T49-6	12/09/82	76.75	12.87	0.96	0.03	0.65	0.06	0.06	0.65	3.80	4.86	100.02
13 1955 WL-4-12 (31.81M), T162-9	5/15/88	76.98	12.89	0.92	0.03	0.65	0.04	0.04	0.65	3.65	4.79	99.99
14 2946 SS-91-4-5(47)	08/13/92	76.55	13.03	0.93	0.04	0.68	0.04	0.04	0.68	3.91	4.82	100.00
15 2924 SS-91-1-2(6)	08/13/92	76.54	12.93	0.92	0.04	0.67	0.02	0.02	0.67	4.00	4.83	100.01
16 1976 WL-5-6 (40.08m), T164-5	5/21/88	76.68	13.08	0.82	0.03	0.66	0.06	0.06	0.66	3.81	4.82	100.01
17 1975 WL-5-6 (39.31m), T164-4	5/21/88	76.69	13.10	0.82	0.04	0.66	0.07	0.07	0.66	3.79	4.78	100.00
18 205 LD-96, T3-4		76.62	13.27	0.92	0.05	0.66	0.08	0.08	0.66	3.54	4.79	100.00
19 2943 SS-91-4-5(22)	08/13/92	76.45	13.01	0.97	0.04	0.67	0.10	0.10	0.67	3.84	4.89	100.01
20 2945 SS-91-4-5(43)	08/13/92	76.60	12.91	0.91	0.06	0.68	0.08	0.08	0.68	3.96	4.75	100.00
21 756 BO-5		76.29	13.42	0.90	0.04	0.66	0.06	0.06	0.66	3.80	4.71	100.00
22 2921 SS-91-4-4(36)	08/13/92	76.88	12.80	0.87	0.07	0.65	0.06	0.06	0.65	3.93	4.72	100.01
23 1956 WL-4-13 (33.32M), T162-10	5/15/88	76.98	12.91	0.86	0.04	0.65	0.06	0.06	0.65	3.60	4.85	99.99
24 700 LD-10*		76.45	13.13	0.97	0.04	0.65	0.08	0.08	0.65	3.71	4.91	100.00
25 1236 WL-2-7 20.32m, T93-5	5/1/85	76.99	13.04	0.89	0.04	0.64	0.07	0.07	0.64	3.56	4.75	100.02

Date of Analysis: 08/13/92

SAMPLE ID: SS-91-2-2B(50)

Recalculated to 100%

Raw ProI Data
(FeO to Fe2O3)

Raw Probe Data

SiO2	75.406	SiO2	76.80
Al2O3	12.519	Al2O3	12.75
FeO	0.721*1.1113=Fe2O3	Fe2O3	0.82
MgO	0.003	MgO	0.00
MnO	0.034	MnO	0.03
CaO	0.654	CaO	0.67
TiO2	0.073	TiO2	0.07
Na2O	4.217	Na2O	4.29
K2O	4.485	K2O	4.57

TOTAL(R) 100.00

TOTAL(N) 98.191

Listing of 50 closest matches for COMP. NO. 2937 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 08/17/92

C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	CaO	TiO2	Na2O	K2O	Total, R	Sim. Co
1	2937 SS-91-2-2B(50)	08/13/92	76.80	12.75	0.82	0.00	0.03	0.67	4.29	4.57	100.00	1.0000
2	572 KRL91982J, T64-14	09/06/83	76.90	12.98	0.83	0.02	0.05	0.67	3.85	4.65	100.01	0.9749
3	2365 SS-91-1 High Ca SS	8/7/91	77.12	12.77	0.83	0.03	0.03	0.67	3.79	4.67	99.98	0.9740
4	695 RSC91		76.82	12.90	0.85	0.01	0.00	0.66	4.00	4.70	99.99	0.9736
5	182 KRL7982-16, T45-3		76.66	13.17	0.83	0.03	0.02	0.68	3.91	4.64	100.01	0.9726
6	2935 SS-91-1-1(36)	08/13/92	76.31	13.22	0.91	0.06	0.06	0.67	4.23	4.51	100.00	0.9720
7	2922 SS-91-4-4(38)	08/13/92	76.47	13.09	0.83	0.07	0.06	0.72	4.03	4.64	100.02	0.9688
8	2947 SS-91-4-5(49)	08/13/92	76.63	13.06	0.83	0.07	0.01	0.65	3.99	4.81	99.99	0.9687
9	2926 SS-91-1-2(17)	08/13/92	76.77	12.98	0.79	0.07	0.13	0.67	3.84	4.72	100.00	0.9681
10	2921 SS-91-4-4(36)	08/13/92	76.88	12.80	0.87	0.07	0.02	0.66	3.93	4.72	100.01	0.9678
11	2942 SS-91-4-5(20)	08/13/92	76.67	12.97	0.82	0.04	0.03	0.70	3.93	4.81	100.00	0.9674
12	1975 WL-5-6 (39.31m) T164-4	5/21/88	76.69	13.10	0.82	0.04	0.05	0.66	3.81	4.82	100.01	0.9658
13	1976 WL-5-6 (40.08m) T164-5	5/21/88	76.30	13.36	0.84	0.04	0.05	0.65	3.98	4.70	99.99	0.9657
14	2931 SS-91-1-5(33)	08/13/92	76.30	13.36	0.84	0.04	0.05	0.65	3.98	4.70	99.99	0.9657
15	2644 JB-B8-17 T241-8	10/21/91	76.22	13.28	0.84	0.04	0.04	0.66	4.04	4.76	100.01	0.9646
16	2845 FLV-213-LC T261-2	7/14/92	76.14	13.26	0.84	0.04	0.06	0.71	4.11	4.79	100.00	0.9642
17	1959 WL-4-18 (43.53M) T162-13	5/15/88	77.01	12.97	0.82	0.04	0.04	0.67	3.63	4.77	100.01	0.9641
18	2925 SS-91-1-2(8)	08/13/92	76.28	12.92	0.94	0.05	0.07	0.65	4.27	4.74	99.99	0.9637
19	1974 WL-5-5 (36.93m) T164-3	5/21/88	76.69	13.09	0.83	0.03	0.05	0.66	3.79	4.82	100.02	0.9629
20	2711 FLV-196-BC T246-5	12/12/91	76.65	12.88	0.90	0.05	0.04	0.67	3.95	4.78	100.00	0.9626
21	454 679-340, T31-2		76.57	13.20	0.84	0.03	0.03	0.70	3.84	4.71	99.99	0.9603
22	1846 FLV-22-W T146-10	8/25/87	75.53	14.00	0.78	0.08	0.10	0.64	4.16	4.63	100.00	0.9596
23	2945 SS-91-4-5(43)	08/13/92	76.60	12.91	0.91	0.06	0.05	0.68	3.96	4.75	100.00	0.9594
24	588 PMR-1, T54-12	07/xx/83	77.00	12.77	0.86	0.13	0.07	0.72	3.88	4.44	100.00	0.9593
25	2569 JB-B8-6 T227-3	6/13/91	76.39	13.29	0.83	0.04	0.06	0.71	3.88	4.74	100.00	0.9590

Date of Analysis: 08/13/92

SAMPLE ID: SS-91-4-1(5)

Recalculated to 100%

Raw Probe Data
(FeO to Fe2O3)

SiO2	73.996	SiO2	76.60
Al2O3	12.439	Al2O3	12.88
FeO	0.670*1.1113=Fe2O3	Fe2O3	0.77
MgO	0.042	MgO	0.04
MnO	0.021	MnO	0.02
CaO	0.672	CaO	0.70
TiO2	0.081	TiO2	0.08
Na2O	3.806	Na2O	3.94
K2O	4.799	K2O	4.97

TOTAL (O) 96.526

TOTAL (N) 96.601

TOTAL (R) 100.00

Listing of 50 closest matches for COMP. NO. 2914 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 08/17/92

C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total, R	Sim. Co
1	2914 SS-91-4-1(5)	08/13/92	76.60	12.88	0.77	0.04	0.02	0.70	0.08	3.94	4.97	100.00	1.0000
2	2942 SS-91-4-5(20)	08/13/92	76.67	12.97	0.82	0.04	0.03	0.70	0.03	3.93	4.81	100.00	0.9827
3	2951 SS-91-3-1(7)	08/13/92	76.40	12.98	0.74	0.12	0.05	0.70	0.05	3.83	5.13	100.00	0.9819
4	2919 SS-91-4-4(24)	08/13/92	76.56	13.14	0.74	0.05	0.03	0.70	0.00	4.02	4.76	100.00	0.9798
5	1962 WL-4-25 (62.76M)	5/13/88	76.91	12.91	0.79	0.05	0.05	0.70	0.09	3.62	4.87	99.99	0.9778
6	2926 SS-91-1-2(17)	08/13/92	76.77	12.98	0.79	0.07	0.13	0.69	0.03	3.84	4.72	100.00	0.9744
7	183 KFL7982-19B, T45-4	5/22/88	76.37	13.29	0.83	0.04	0.02	0.71	0.07	3.88	4.79	100.00	0.9714
8	1993 WL-5-26 (96.00m)	6/13/91	76.63	12.63	0.77	0.09	0.08	0.61	0.16	3.98	5.06	100.01	0.9702
9	2569 JB-B5-6 T227-3	5/22/88	76.39	13.29	0.83	0.04	0.06	0.71	0.06	3.88	4.74	100.00	0.9698
10	1982 WL-5-13 (64.49m)	5/22/88	76.59	13.19	0.83	0.03	0.05	0.70	0.07	3.73	4.80	99.99	0.9694
11	1358 WL 4-28 66.75m t95-5	5/29/85	76.94	12.84	0.81	0.05	0.04	0.73	0.07	3.77	4.75	100.00	0.9691
12	2644 JB-B5-17 T241-8	10/21/91	76.22	13.28	0.84	0.04	0.08	0.70	0.05	4.04	4.76	100.01	0.9691
13	454 679-340, T31-2	08/13/92	76.57	13.20	0.84	0.03	0.03	0.70	0.07	3.84	4.71	99.99	0.9691
14	2913 SS-91-4-3(19)	08/13/92	76.73	12.74	0.89	0.05	0.02	0.71	0.08	3.90	4.89	100.01	0.9687
15	2909 SS-91-4-2(39)	08/13/92	76.57	12.86	0.92	0.10	0.05	0.70	0.03	3.93	4.85	100.01	0.9681
16	2930 SS-91-2-2A(33)	08/13/92	77.37	12.47	0.77	0.05	0.04	0.63	0.03	3.94	4.70	100.00	0.9673
17	1976 WL-5-6 (40.08m)	5/21/88	76.68	13.08	0.82	0.03	0.05	0.66	0.06	3.81	4.82	100.01	0.9671
18	182 KFL7982-16, T45-3	08/13/92	76.66	13.17	0.83	0.03	0.02	0.68	0.07	3.91	4.64	100.01	0.9671
19	2947 SS-91-4-5(49)	08/13/92	76.63	13.06	0.83	0.01	0.01	0.65	0.00	3.99	4.81	99.99	0.9662
20	2948 SS-91-1-7(27)	5/2/85	76.50	13.05	0.86	0.04	0.07	0.67	0.08	3.81	4.93	100.01	0.9662
21	1243 WL 4-26 66.40m T93-12	08/13/92	76.71	13.12	0.83	0.05	0.04	0.71	0.06	3.70	4.78	100.00	0.9658
22	2910 SS-91-4-2(41)	08/13/92	77.06	12.68	0.86	0.01	0.03	0.69	0.04	3.81	4.81	99.99	0.9657
23	2922 SS-91-4-4(38)	08/13/92	76.47	13.09	0.83	0.07	0.06	0.72	0.11	4.03	4.64	100.02	0.9656
24	2845 FLV-213-LC T261-2	7/14/92	76.14	13.26	0.84	0.04	0.06	0.71	0.05	4.11	4.79	100.00	0.9651
25	1975 WL-5-6 (39.31m)	5/21/88	76.69	13.10	0.82	0.04	0.05	0.66	0.07	3.79	4.78	100.00	0.9646

SAMPLE ID: SS-91-4-2(41)

Recalculated to 100%

Raw Probe Data	Raw Prc' : Data (FeO to Fe2O3)
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Phase	2θ	hkl	Intensity
SiO ₂	73.322		77.06
Al ₂ O ₃	12.064		12.68
FeO	0.741*1.1113=Fe ₂ O ₃	0.823	0.86
MgO	0.014		0.01
MnO	0.031		0.03
CaO	0.655		0.69
TiO ₂	0.038		0.04
Na ₂ O	3.623		3.81
K ₂ O	4.581		4.81

TOTAL (O)	95 068	TOTAL (N)	95.150	TOTAL (R)	99.99
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[illegible]

1	2910	SS-91-4-2(41)	08/13/92	77.06	12.68	0.86	0.01	0.03	0.69	0.04	3.81	4.81	99.99	1.0000
2	545	KPL7982-17, T50-4	02/01/83	76.61	13.14	0.87	0.03	0.04	0.68	0.05	3.77	4.79	99.98	0.9864
3	2948	SS-91-1-7(37)	08/13/92	76.50	13.05	0.86	0.04	0.07	0.67	0.08	3.81	4.79	100.01	0.9852
4	1045	WDPL 36-10-2 88A, T78-5	07/18/84	76.90	12.80	0.85	0.04	0.04	0.72	0.09	3.73	4.93	100.00	0.9850
5	1259	*WL 4-26 66.87m T95-6	5/29/95	77.01	12.69	0.88	0.05	0.04	0.73	0.09	3.81	4.71	100.00	0.9834
6	2944	SS-91-4-5(38)	08/13/92	77.06	12.60	0.90	0.04	0.05	0.70	0.07	3.85	4.69	99.99	0.9833
7	1979	WL-5-12 (61.28m) T164-8	5/22/88	76.51	13.26	0.87	0.04	0.05	0.70	0.07	3.76	4.75	100.01	0.9830
8	2565	SS-91-1 high Ca SS 8/7/91	77.12	12.77	0.88	0.03	0.03	0.05	0.67	0.05	3.79	4.67	99.98	0.9823
9	455	679-409-6, T31-1	76.71	13.04	0.88	0.03	0.03	0.03	0.66	0.07	3.78	4.80	100.00	0.9819
10	2913	SS-91-4-3(19)	08/13/92	76.73	12.74	0.89	0.05	0.02	0.71	0.08	3.90	4.89	100.01	0.9816
11	454	679-340, T31-2	76.57	13.20	0.84	0.03	0.03	0.03	0.70	0.07	3.84	4.71	99.99	0.9814
12	2921	SS-91-4-4(36)	08/13/92	76.88	12.80	0.87	0.07	0.02	0.66	0.06	3.93	4.72	100.01	0.9807
13	1982	WL-5-13 (64.49m) T164-11	5/22/88	76.59	13.19	0.83	0.03	0.05	0.70	0.07	3.73	4.80	99.99	0.9805
14	1039	WL 4-26-3.06, T78-12	08/18/84	76.97	12.78	0.86	0.04	0.03	0.73	0.06	3.65	4.87	100.01	0.9803
15	2942	SS-91-4-5(20)	08/13/92	76.67	12.97	0.82	0.04	0.03	0.70	0.03	3.93	4.61	100.00	0.9802
16	1342	WL 4-26 66.33m T93-11	5/2/85	76.55	13.16	0.87	0.05	0.04	0.71	0.05	3.69	4.78	100.00	0.9800
17	1136	WL 4-26 13.11M T84-12	12/3/84	76.59	13.09	0.89	0.04	0.06	0.71	0.07	3.74	4.82	100.01	0.9800
18	174	WL-5-5 (36.93m) T164-3	5/21/88	76.69	13.16	0.87	0.03	0.05	0.66	0.06	3.79	4.82	100.02	0.9797
19	495	IIB, T32-1	76.58	13.09	0.83	0.03	0.03	0.06	0.71	0.05	3.87	4.68	100.01	0.9792
20	191	LD-10, T40-2	76.71	13.04	0.91	0.04	0.03	0.03	0.68	0.07	3.80	4.71	99.99	0.9792
21	1976	FLW-5-6 (40.08m) T164-5	09/06/93	76.68	13.08	0.82	0.03	0.05	0.66	0.06	3.81	4.82	100.01	0.9792
22	572	KPL1982Y, T64-14	5/23/88	76.90	12.98	0.83	0.02	0.05	0.67	0.06	3.85	4.65	100.01	0.9779
23	1998	WL-5-57 (144.18m) T165-13	5/23/88	77.70	11.93	0.88	0.05	0.08	0.71	0.09	3.76	4.82	100.02	0.9778
24	2711	FLV-196-BC T248-5	5/23/88	76.65	12.88	0.90	0.05	0.04	0.67	0.08	3.95	4.78	100.00	0.9773
25	1243	WL 4-26 66.40m T93-12	12/2/85	76.71	13.12	0.83	0.05	0.04	0.71	0.06	3.70	4.78	100.00	0.9773

SAMPLE ID: SS-91-4-3(15)

Date of Analysis: 08/13/92

Raw Probe Data Raw Probe Data Recalculated to 100%

(FeO to Fe2O3)

SiO2	71.493	SiO2	76.36
Al2O3	12.310	Al2O3	13.15
FeO	0.730*1.1113=Fe2O3	Fe2O3	0.87
MgO	0.061	MgO	0.07
MnO	0.040	MnO	0.04
CaO	0.687	CaO	0.73
TiO2	0.049	TiO2	0.05
Na2O	3.755	Na2O	4.01
K2O	4.420	K2O	4.72

TOTAL(O) 93.543 TOTAL(N) 93.624 TOTAL(R) 100.00

Listing of 50 closest matches for COMPO. NO. 2912 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 08/17/92

C.No Sample Number Date SiO2 Al2O3 Fe2O3 MgO MnO CaO TiO2 Na2O K2O Total, R Sim. Co

1	2912	SS-91-4-3(15)	08/13/92	76.36	13.15	0.87	0.07	0.04	0.73	0.05	4.01	4.72	100.00	1.0000
2	2709	FLV-194-BC T246-3	12/12/91	76.50	12.97	0.88	0.05	0.05	0.72	0.06	4.00	4.75	99.98	0.9918
3	495	ILB, T32-1	08/13/92	76.58	13.16	0.87	0.03	0.06	0.71	0.05	3.87	4.68	100.01	0.9876
4	2922	SS-91-4-4(38)	08/13/92	76.47	13.09	0.83	0.07	0.06	0.72	0.11	4.03	4.64	100.02	0.9854
5	2938	SS-91-4-5(5)	08/13/92	76.41	13.19	0.84	0.03	0.03	0.76	0.08	3.96	4.71	100.01	0.9846
6	2941	SS-91-4-5(15)	08/13/92	76.34	13.25	0.90	0.03	0.03	0.70	0.07	3.95	4.73	100.00	0.9834
7	2644	JB-B3-17 T241-8	10/21/91	76.22	13.28	0.84	0.04	0.08	0.70	0.05	4.04	4.76	100.01	0.9828
8	1259	*WL 4-16 66.87m t95-6	5/29/85	77.01	12.69	0.88	0.04	0.04	0.73	0.09	3.81	4.71	100.00	0.9822
9	1257	*HL 4-26 66.68m	5/29/85	76.78	12.82	0.88	0.05	0.05	0.75	0.07	3.86	4.73	99.99	0.9820
10	2845	FLV-213-LC T261-2	7/14/92	76.14	13.26	0.84	0.04	0.06	0.71	0.05	4.11	4.79	100.00	0.9813
11	1279	WL-5-12 (61.28m) T164-8	5/22/88	76.51	13.26	0.87	0.04	0.05	0.70	0.07	3.76	4.75	100.01	0.9800
12	2569	JB-B3-6 T227-3	6/13/91	76.39	13.29	0.83	0.04	0.06	0.71	0.06	3.80	4.74	100.00	0.9798
13	2940	SS-91-4-5(7)	08/13/92	76.31	13.15	0.92	0.02	0.04	0.71	0.11	3.93	4.82	100.01	0.9795
14	1242	WL 4-26 66.33m T93-11	5/2/85	76.65	13.16	0.87	0.05	0.04	0.71	0.05	3.69	4.78	100.00	0.9793
15	154	679-140, T31-2		76.57	13.20	0.84	0.03	0.03	0.70	0.07	3.84	4.71	99.99	0.9789
16	183	KUL7982-19B, T45-4	08/13/92	76.37	13.29	0.83	0.04	0.02	0.71	0.07	3.88	4.79	100.00	0.9782
17	2950	SS-91-3-2(50)	08/13/92	76.56	13.05	0.92	0.04	0.00	0.71	0.07	4.06	4.59	100.00	0.9780
18	1963	WL-4-26 (66.50m) T163-7	5/13/88	76.67	13.24	0.84	0.04	0.04	0.73	0.07	3.66	4.70	99.99	0.9772
19	1136	WL-5-13-1.11M T84-12	12/3/84	76.59	13.09	0.89	0.04	0.06	0.71	0.07	3.74	4.82	100.01	0.9757
20	545	KUL7982-17, T50-4	02/01/83	76.61	13.14	0.87	0.03	0.04	0.68	0.05	3.77	4.79	99.98	0.9755
21	2913	SS-91-4-3(19)	08/13/92	76.73	12.74	0.89	0.05	0.02	0.71	0.08	3.90	4.89	100.01	0.9753
22	2921	SS-91-4-4(36)	08/13/92	76.68	12.80	0.87	0.04	0.02	0.66	0.06	3.93	4.72	100.01	0.9751
23	1958	WL-4-17 (39.81M) T162-12	5/15/88	76.91	12.98	0.84	0.04	0.05	0.72	0.05	3.70	4.70	99.99	0.9750
24	756	BO-5		76.29	13.42	0.90	0.04	0.06	0.70	0.08	3.80	4.71	100.00	0.9750
25	695	R3C91		76.82	12.90	0.85	0.01	0.00	0.66	0.05	4.00	4.70	99.99	0.9749

Date of Analysis: 08/13/92

SAMPLE ID: SS-91-4-3(19)

Recalculated to 100%

Raw Probe Data
(FeO to Fe2O3)

SiO2	75.664	SiO2	76.73
Al2O3	12.561	Al2O3	12.74
FeO	0.786*1.1113=Fe2O3	Fe2O3	0.89
MgO	0.051	MgO	0.05
MnO	0.018	MnO	0.02
CaO	0.697	CaO	0.71
TiO2	0.075	TiO2	0.08
Na2O	3.847	Na2O	3.90
K2O	4.825	K2O	4.89

TOTAL(R) 100.01

TOTAL(N) 9.611

TOTAL(O) 98.524

Listing of 50 closest matches for COMP. NO. 2913 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 08/17/92

C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total, R	Sim. Co
1	2913 SS-91-4-3(19)	08/13/92	76.73	12.74	0.89	0.05	0.02	0.71	0.08	3.90	4.89	100.01	1.0000
2	2909 SS-91-4-2(39)	08/13/92	76.57	12.86	0.92	0.10	0.05	0.70	0.03	3.93	4.85	100.01	0.9877
3	1136 WL-5-13-1.11M T84-12	12/3/84	76.59	13.09	0.89	0.04	0.06	0.71	0.07	3.74	4.82	100.01	0.9860
4	2940 SS-91-4-5(7)	08/13/92	76.31	13.15	0.92	0.02	0.04	0.71	0.11	3.93	4.82	100.01	0.9848
5	2944 SS-91-4-5(38)	08/13/92	77.06	12.60	0.90	0.05	0.07	0.70	0.07	3.85	4.69	99.99	0.9843
6	2709 FLV-194-BC T246-3	12/12/91	76.50	12.97	0.88	0.05	0.05	0.72	0.06	4.00	4.75	99.98	0.9834
7	1259 *WL 4-26 66.87m T25-6	5/29/85	77.01	12.69	0.88	0.04	0.04	0.73	0.09	3.81	4.71	100.00	0.9823
8	495 IIR, T32-1		76.58	13.16	0.87	0.03	0.06	0.71	0.05	3.87	4.68	100.01	0.9822
9	2910 SS-91-4-2(41)	08/13/92	77.06	12.68	0.86	0.01	0.03	0.69	0.04	3.81	4.81	99.99	0.9816
10	2941 SS-91-4-5(15)	08/13/92	76.34	13.25	0.90	0.03	0.03	0.70	0.07	3.95	4.73	100.00	0.9810
11	1257 *WL 4-26 66.58m	5/29/85	76.78	12.82	0.88	0.05	0.05	0.75	0.07	3.86	4.73	99.99	0.9809
12	2711 FLV-196-BC T246-5	12/12/91	76.65	12.88	0.90	0.05	0.04	0.67	0.08	3.95	4.78	100.00	0.9809
13	1045 DSDP 36-10-2 83A, T78-5	07/10/84	76.90	12.80	0.85	0.04	0.04	0.72	0.09	3.73	4.83	100.00	0.9797
14	2945 SS-91-4-5(43)	08/13/92	76.60	12.91	0.91	0.06	0.05	0.68	0.08	3.96	4.75	100.00	0.9795
15	2946 SS-91-4-5(47)	08/13/92	76.55	13.03	0.93	0.04	0.00	0.68	0.04	3.91	4.82	100.00	0.9789
16	1242 WL 4-26 66.33m T23-11	5/2/85	76.65	13.16	0.87	0.05	0.04	0.71	0.05	3.69	4.78	100.00	0.9780
17	1033 KRL-71082 (T1-4) (593) T58-4	6/22/84	76.44	13.18	0.88	0.05	0.00	0.70	0.07	3.69	4.98	99.99	0.9776
18	2942 SS-91-4-5(20)	08/13/92	76.67	12.97	0.82	0.04	0.03	0.73	0.03	3.93	4.81	100.00	0.9775
19	1039 WL 4-26-3.06, T78-12	08/10/84	76.97	12.78	0.86	0.04	0.05	0.73	0.06	3.65	4.87	100.01	0.9774
20	1998 WL-5-57 (144.18m) T165-13	5/22/88	77.70	11.93	0.88	0.05	0.08	0.71	0.09	3.76	4.82	100.02	0.9771
21	183 KRL7982-198, T45-4		76.37	13.29	0.83	0.04	0.02	0.71	0.07	3.88	4.79	100.00	0.9768
22	2939 SS-91-4-5(6)	08/13/92	77.04	12.72	0.95	0.05	0.03	0.71	0.03	3.77	4.70	100.00	0.9765
23	2921 SS-91-4-4(36)	08/13/92	76.88	12.80	0.87	0.07	0.02	0.66	0.06	3.93	4.72	100.01	0.9763
24	2917 SS-91-4-4(15)	08/13/92	76.23	13.18	0.99	0.01	0.06	0.71	0.01	3.90	4.90	99.99	0.9762
25	1979 WL-5-12 (61.28m) T164-8	5/22/88	76.51	13.26	0.87	0.04	0.05	0.70	0.07	3.76	4.75	100.01	0.9761

Date of Analysis: 08/13/92

SAMPLE ID: SS-91-4-4(8)

Recalculated to 100%

Raw Probe Data
(FeO to Fe2O3)

SiO2	72.873	SiO2	76.64
Al2O3	12.453	Al2O3	13.10
FeO	0.848*1.1113=Fe2O3	Fe2O3	0.99
MgO	0.034	MgO	0.04
MnO	0.029	MnO	0.03
CaO	0.615	CaO	0.65
TiO2	0.082	TiO2	0.09
Na2O	3.698	Na2O	3.89
K2O	4.361	K2O	4.59

TOTAL(R) 100.02

TOTAL(N) 95.087

Listing of 50 closest matches for COMP. NO. 2916 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 08/17/92

C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total	R	Sim.	Co
1	2916 SS-91-4-4(8)	08/13/92	76.64	13.10	0.99	0.04	0.03	0.65	0.09	3.89	4.59	100.02	1.0000		
2	544 KXL7982-14, T50-3	02/01/83	76.58	13.06	1.00	0.03	0.04	0.65	0.05	3.88	4.71	100.00	0.9930		
3	2923 SS-91-4-4(42)	08/13/92	76.68	12.98	1.02	0.04	0.03	0.65	0.06	3.90	4.63	100.01	0.9916		
4	496 IIR-1, T32-2	12/09/82	76.70	13.13	0.99	0.03	0.05	0.65	0.05	3.69	4.72	100.01	0.9863		
5	539 KXL7982-4L, T49-4	12/09/82	77.02	12.87	0.98	0.03	0.04	0.63	0.03	3.91	4.48	100.00	0.9863		
6	2712 FLV-197-BC, T246-6	12/12/91	76.46	12.98	0.98	0.04	0.05	0.65	0.06	4.02	4.77	100.01	0.9847		
7	543 KXL7982-8, 12/09/82	12/09/82	76.68	13.00	0.97	0.02	0.03	0.64	0.05	3.84	4.77	100.00	0.9843		
8	2918 SS-91-4-4(19)	08/13/92	76.98	12.65	1.04	0.03	0.07	0.66	0.01	3.99	4.68	100.01	0.9798		
9	537 KXL7982-E, T50-2	02/01/83	76.77	12.99	0.98	0.05	0.04	0.66	0.06	3.69	4.76	100.00	0.9796		
10	541 KXL7932-6, T49-6	12/09/82	76.75	12.87	0.96	0.03	0.04	0.65	0.06	3.80	4.86	100.02	0.9787		
11	180 KXL7982-11L, T44-8	08/13/92	76.76	13.01	0.92	0.02	0.03	0.63	0.04	3.89	4.70	100.00	0.9778		
12	2943 SS-91-4-5(22)	08/13/92	76.45	13.01	0.97	0.04	0.04	0.67	0.10	3.84	4.89	100.01	0.9777		
13	700 LD-10*		76.45	13.13	0.97	0.04	0.06	0.65	0.08	3.71	4.91	100.00	0.9773		
14	948 DR-60		76.95	12.91	0.97	0.03	0.05	0.63	0.06	3.70	4.70	100.00	0.9764		
15	2933 SS-91-1-1(11)	08/13/92	76.05	13.33	1.00	0.01	0.03	0.68	0.11	3.88	4.92	100.01	0.9752		
16	842 GS-88		76.75	12.91	1.07	0.03	0.04	0.64	0.06	3.80	4.70	100.00	0.9746		
17	540 KXL7982-4U, T49-5	12/09/82	76.91	12.96	0.96	0.02	0.05	0.59	0.03	3.94	4.55	100.01	0.9736		
18	712 LD-60*		76.58	13.13	0.97	0.04	0.05	0.62	0.08	3.71	4.81	99.99	0.9730		
19	2917 SS-91-4-4(15)	08/13/92	76.23	13.18	0.99	0.01	0.06	0.71	0.01	3.90	4.90	99.99	0.9730		
20	497 IV, T32-3		76.29	13.14	1.03	0.03	0.05	0.62	0.06	4.01	4.78	100.01	0.9730		
21	2946 SS-91-4-5(47)	08/13/92	76.55	13.03	0.93	0.04	0.00	0.68	0.04	3.91	4.82	100.00	0.9727		
22	2486 FLV-146-V8, T218-7	11/19/90	76.83	13.18	1.00	0.04	0.04	0.69	0.06	3.68	4.59	100.01	0.9725		
23	179 KXL7982-11U, T45-1		76.81	12.97	0.95	0.03	0.03	0.60	0.05	3.84	4.72	100.00	0.9717		
24	176 KXL7982-5, T44-5		76.67	12.93	0.98	0.03	0.04	0.60	0.05	3.83	4.87	100.00	0.9711		
25	2915 SS-91-4-1(33)	08/13/92	76.40	12.96	1.06	0.00	0.02	0.66	0.05	4.00	4.84	99.99	0.9710		

Date of Analysis: 08/13/92

SAMPLE ID: SS-91-4-4(42)

Recalculated to 100%

R. Probe Data
(FeO to Fe2O3)

Raw Probe Data

SiO2	72.785	SiO2	76.68
Al2O3	12.322	Al2O3	12.98
FeO	0.873*1.1113=Fe2O3	Fe2O3	1.02
MgO	0.037	MgO	0.04
MnO	0.046	MnO	0.05
CaO	0.614	CaO	0.65
TiO2	0.054	TiO2	0.06
Na2O	3.705	Na2O	3.90
K2O	4.393	K2O	4.63

TOTAL(O) 94.829 TOTAL(N) 94.926 TOTAL(R) 100.01

Listing of 50 closest matches for COMP. NO. 2923 for elements: Na, Al, Si, K, Ca, Fe									
Date of Update: 08/17/92									
C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	CaO	TiO2	Na2O
K2O Total, R sim. Co									
1	2923 SS-91-4-4(42)	08/13/92	76.68	12.98	1.02	0.04	0.05	0.65	0.06
2	544 KRL7982-14, T50-3	02/01/83	76.58	13.06	1.00	0.03	0.04	0.65	0.05
3	2916 SS-91-4-4(8)	08/13/92	76.54	13.10	0.99	0.04	0.03	0.65	0.09
4	2918 SS-91-4-4(19)	08/13/92	76.98	12.85	1.04	0.03	0.07	0.66	0.01
5	2712 FLV-197-BC T246-6	12/13/91	76.46	12.98	0.98	0.04	0.05	0.65	0.06
6	539 KRL7982-4L, T49-4	12/09/82	77.02	12.87	0.99	0.03	0.04	0.63	0.03
7	842 GS-88	12/09/82	76.75	12.91	1.07	0.03	0.04	0.64	0.06
8	543 KRL7982-8, 12/09/82	12/09/82	76.58	13.00	0.97	0.02	0.03	0.64	0.05
9	495 IIR-1 T32-2	12/09/82	76.70	13.13	0.99	0.03	0.05	0.65	0.05
10	2915 SS-91-4-1(33)	08/13/92	76.40	12.96	1.06	0.00	0.02	0.66	0.05
11	497 IV, T32-3	12/09/82	76.29	13.14	1.03	0.03	0.05	0.62	0.06
12	542 KRL7982-7L, T49-7	12/09/82	76.73	12.94	1.04	0.03	0.02	0.61	0.06
13	537 KRL7982-E, T50-2	02/01/83	76.77	12.99	0.98	0.05	0.04	0.66	0.06
14	541 KRL7982-6, T49-6	12/09/82	76.75	12.87	0.96	0.03	0.04	0.65	0.06
15	180 KRL7982-11L, T44-8	1/16/87	76.76	13.01	0.92	0.02	0.03	0.63	0.04
16	1705 1986-122 T135-9	08/13/92	76.92	12.94	1.03	0.08	0.05	0.60	0.11
17	2943 SS-91-4-5(22)	08/13/92	76.45	13.01	0.97	0.04	0.04	0.67	0.10
18	948 DR-60	08/13/92	76.95	12.91	0.97	0.03	0.05	0.63	0.06
19	2933 SS-91-1-1(11)	08/13/92	76.05	13.33	1.00	0.01	0.03	0.68	0.11
20	1004 RC-31	10/28/88	76.84	12.92	1.06	0.04	0.05	0.59	0.08
21	2110 KRL-82982-F T174-14	08/13/92	76.85	12.91	1.02	0.02	0.05	0.56	0.09
22	700 LD-10*	08/13/92	76.45	13.13	0.97	0.04	0.06	0.65	0.08
23	2934 SS-91-1-1(15)	8/15/91	76.33	12.95	1.10	0.06	0.03	0.66	0.03
24	2608 LY-C-514 T232-8	08/13/92	76.89	12.89	1.05	0.05	0.06	0.58	0.06
25	2946 SS-91-4-5(47)	08/13/92	76.55	13.03	0.93	0.04	0.00	0.68	0.04

SAMPLE ID: SS-91-4-5(5)

Date of Analysis: 08/13/92

Raw Probe Data

Raw Probe Data

Recalculated to 100%

SiO2	73.260	SiO2	76.41
Al2O3	12.645	Al2O3	13.19
FeO	0.726*1.1113=Fe2O3	Fe2O3	0.84
MgO	0.026	MgO	0.03
MnO	0.027	MnO	0.03
CaO	0.726	CaO	0.76
TiO2	0.075	TiO2	0.08
Na2O	3.794	Na2O	3.96
K2O	4.519	K2O	4.71
TOTAL(O)	95.798	TOTAL(R)	100.01

Listing of 50 closest matches for COMP. NO. 2938 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 08/17/92												
C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	CaO	TiO2	Na2O	K2O	Total, R	Sim. Co
1	2938 SS-91-4-5(5)	08/13/92	76.41	13.19	0.84	0.03	0.76	0.08	3.96	4.71	100.01	1.0000
2	2912 SS-91-4-3(15)	08/13/92	76.36	13.15	0.87	0.07	0.73	0.05	4.01	4.72	100.00	0.9846
3	2922 SS-91-4-4(38)	08/13/92	76.47	13.09	0.83	0.07	0.72	0.11	4.03	4.64	100.02	0.9825
4	2569 JB-BB-6 T227-3	6/13/91	76.39	13.29	0.83	0.04	0.71	0.06	3.88	4.74	100.00	0.9813
5	454 679-340, T31-2	10/21/91	76.57	13.20	0.84	0.03	0.70	0.07	3.84	4.71	99.99	0.9813
6	2444 JB-BB-17 T241-8	5/29/85	76.22	13.28	0.84	0.04	0.70	0.05	4.04	4.76	100.01	0.9802
7	1257 *WL 4-26 66.68m	5/29/85	76.78	12.82	0.88	0.05	0.75	0.07	3.86	4.73	99.99	0.9798
8	183 *KXL7982-19B, T45-4	5/15/88	76.37	13.29	0.83	0.04	0.71	0.07	3.88	4.79	100.00	0.9796
9	1963 WL-4-26 (66.50M) T163-7	5/15/88	76.67	13.24	0.84	0.04	0.73	0.07	3.66	4.70	99.99	0.9792
10	1964 WL-4-27 (68.59M) T163-8	5/15/88	76.85	13.06	0.85	0.04	0.75	0.06	3.64	4.69	100.00	0.9791
11	2845 FLV-213-IC T261-2	7/14/92	76.14	13.26	0.84	0.04	0.71	0.05	4.11	4.79	100.00	0.9787
12	495 IIB, T32-1	12/12/91	76.58	13.16	0.87	0.03	0.71	0.05	3.87	4.68	100.01	0.9777
13	2709 FLV-194-BC T246-3	08/13/92	76.50	12.97	0.88	0.05	0.72	0.06	4.00	4.75	99.98	0.9776
14	2936 SS-91-3-Su(33)	08/13/92	75.96	13.31	0.85	0.08	0.81	0.04	4.17	4.70	100.00	0.9765
15	1958 WL-4-17 (39.81M) T162-12	5/15/88	76.91	12.98	0.84	0.04	0.72	0.05	3.70	4.70	99.99	0.9762
16	1260 *WL 4-26 66.7.04m T95-7	5/29/85	77.27	12.59	0.84	0.04	0.74	0.06	3.73	4.70	100.02	0.9761
17	182 *KXL7982-16, T45-3	08/13/92	76.66	13.17	0.83	0.03	0.68	0.07	3.91	4.64	100.01	0.9751
18	2942 SS-91-4-5(20)	7/2/91	76.67	12.97	0.82	0.04	0.70	0.03	3.93	4.81	100.00	0.9740
19	2595 EL-1-M T230-5	08/13/92	76.61	13.14	0.85	0.06	0.79	0.08	3.64	4.79	100.00	0.9744
20	2941 SS-91-4-5(15)	08/13/92	76.34	13.25	0.90	0.03	0.70	0.07	3.95	4.73	100.00	0.9737
21	1983 WL-5-16 (73.40m) T164-12	5/22/88	76.37	13.29	0.81	0.05	0.75	0.10	3.70	4.89	100.00	0.9734
22	1258 *WL 4-26 66.79m T95-5	5/29/85	76.94	12.84	0.81	0.05	0.73	0.07	3.77	4.75	100.00	0.9725
23	2931 SS-91-1-5(33)	08/13/92	76.30	13.36	0.84	0.04	0.65	0.07	3.98	4.70	99.99	0.9723
24	1243 WL 4-26 66.40m T93-12	5/2/85	76.71	13.12	0.83	0.05	0.71	0.06	3.70	4.78	100.00	0.9721
25	1259 *WL 4-26 66.87m T95-6	5/29/85	77.01	12.69	0.88	0.04	0.73	0.09	3.81	4.71	100.00	0.9719

SAMPLE ID: SS-91-4-5(7)

Date of Analysis: 08/13/92

Raw Probe Data Raw Probe Data Recalculated to 100%

(FeO to Fe2O3)

SiO2	71.540	SiO2	76.31
Al2O3	12.330	Al2O3	13.15
FeO	0.773*1.1113=Fe2O3	Fe2O3	0.92
MgO	0.023	MgO	0.02
MnO	0.037	MnO	0.04
CaO	0.661	CaO	0.71
TiO2	0.102	TiO2	0.11
Na2O	3.682	Na2O	3.93
K2O	4.516	K2O	4.82

TOTAL(O) 93.663 TOTAL(N) 93.749 TOTAL(R) 100.01

Listing of 50 closest matches for COMP. NO. 2940 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 08/17/92

C.No Sample Number Date SiO2 Al2O3 Fe2O3 MgO MnO CaO TiO2 Na2O K2O Total, R Sim. Co

1 2940 SS-91-4-5(7)	08/13/92	76.31	13.15	0.92	0.02	0.04	0.71	0.11	3.93	4.82	100.01	1.0000
2 2909 SS-91-4-2(39)	08/13/92	76.57	12.86	0.92	0.10	0.05	0.70	0.03	3.93	4.85	100.01	0.9924
3 2941 SS-91-4-5(15)	08/13/92	76.34	13.25	0.90	0.03	0.03	0.70	0.07	3.95	4.73	100.00	0.9888
4 2946 SS-91-4-5(47)	08/13/92	76.55	13.03	0.93	0.04	0.00	0.68	0.04	3.91	4.82	100.00	0.9883
5 1136 WL-5-13-1.11M T04-12	12/3/84	76.59	13.09	0.89	0.04	0.06	0.71	0.07	3.74	4.82	100.01	0.9851
6 2950 SS-91-3-2(50)	08/13/92	76.56	13.05	0.92	0.04	0.00	0.71	0.07	4.06	4.59	100.00	0.9849
7 2913 SS-91-4-3(19)	08/13/92	76.73	12.74	0.89	0.05	0.02	0.71	0.08	3.90	4.89	100.01	0.9848
8 2924 SS-91-1-2(6)	08/13/92	76.54	12.93	0.92	0.04	0.05	0.67	0.02	4.00	4.83	100.00	0.9841
9 2945 SS-91-4-5(43)	08/13/92	76.60	12.91	0.91	0.06	0.05	0.68	0.08	3.96	4.75	100.00	0.9838
10 2917 SS-91-4-4(15)	08/13/92	76.23	13.18	0.99	0.01	0.06	0.71	0.01	3.90	4.90	99.99	0.9837
11 495 IIR, T32-1	08/13/92	76.58	13.16	0.87	0.03	0.06	0.71	0.05	3.87	4.68	100.01	0.9828
12 2709 FLV-194-BC T246-3	12/12/91	76.50	12.97	0.88	0.05	0.05	0.72	0.06	4.00	4.75	99.98	0.9824
13 574 KRL92082-A, T53-3	03/25/83	76.12	13.32	0.94	0.04	0.04	0.67	0.06	3.95	4.86	100.00	0.9823
14 756 BO-5	12/12/91	76.29	13.42	0.90	0.04	0.06	0.70	0.08	3.80	4.71	100.00	0.9813
15 2711 FLV-196-BC T246-5	12/12/91	76.65	12.88	0.90	0.05	0.04	0.67	0.08	3.95	4.78	100.00	0.9806
16 191 LD-10, T40-2	08/13/92	76.71	13.04	0.91	0.04	0.03	0.68	0.07	3.80	4.71	99.99	0.9796
17 2912 SS-91-4-3(15)	08/13/92	76.36	13.15	0.87	0.07	0.04	0.73	0.05	4.01	4.72	100.00	0.9795
18 183 KRL7982-12B, T45-4	08/13/92	76.37	13.29	0.83	0.04	0.02	0.71	0.07	3.88	4.79	100.00	0.9787
19 1242 WL 4-26 66.33m T93-11	5/2/85	76.65	13.16	0.87	0.05	0.04	0.71	0.05	3.69	4.78	100.00	0.9785
20 2944 SS-91-4-5(38)	08/13/92	77.06	12.60	0.90	0.05	0.07	0.70	0.07	3.85	4.69	99.99	0.9775
21 1979 WL-5-12 (61.28m) T164-8	5/22/88	76.51	13.26	0.87	0.04	0.05	0.70	0.07	3.76	4.75	100.01	0.9771
22 2569 UB-B3-6 T227-3	6/13/91	76.59	13.29	0.83	0.04	0.06	0.71	0.06	3.88	4.74	100.00	0.9763
23 1977 WL-5-7 (50.91m) T164-6	5/21/88	76.58	13.13	0.93	0.04	0.05	0.71	0.08	3.54	4.94	100.00	0.9768
24 2939 SS-91-4-5(6)	08/13/92	77.04	12.72	0.95	0.05	0.03	0.71	0.03	3.77	4.70	100.00	0.9768
25 2942 SS-91-4-5(20)	08/13/92	76.67	12.97	0.82	0.04	0.03	0.70	0.03	3.93	4.81	100.00	0.9761

SAMPLE ID: SS-91-4-5(15)

Date of Analysis: 08/13/92

Raw Probe Data
Raw Probe Data
(FeO to Fe2O3)

SiO2 73.120
Al2O3 12.691
FeO 0.773*1.1113=Fe2O3 0.859
MgO 0.028
MnO 0.030
CaO 0.668
TiO2 0.064
Na2O 3.784
K2O 4.532

SiO2 76.34
Al2O3 13.25
Fe2O3 0.90
MgO 0.03
MnO 0.03
CaO 0.70
TiO2 0.07
Na2O 3.95
K2O 4.73

TOTAL(O) 95.690 TOTAL(N) 95.776 TOTAL(R) 100.00

Listing of 50 closest matches for COMP. NO. 2941 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 08/17/92
C.No Sample Number Date SiO2 Al2O3 Fe2O3 MgO MnO CaO TiO2 Na2O K2O Total, R Sim. Co

1	2941	SS-91-4-5(15)	08/13/92	76.34	13.25	0.90	0.03	0.03	0.70	0.07	3.95	4.73	100.00	1.0000
2	756	BO-5	08/13/92	76.29	13.42	0.90	0.04	0.06	0.70	0.08	3.80	4.71	100.00	0.9907
3	2940	SS-91-4-5(7)	08/13/92	76.31	13.15	0.92	0.02	0.04	0.71	0.11	3.93	4.82	100.01	0.9888
4	2945	SS-91-4-5(43)	08/13/92	76.60	12.91	0.91	0.06	0.05	0.68	0.08	3.96	4.75	100.00	0.9874
5	2909	SS-91-4-2(39)	08/13/92	76.57	12.86	0.92	0.10	0.05	0.70	0.03	3.93	4.85	100.01	0.9860
6	2711	FLV-196-BC T246-5	12/12/91	76.55	12.88	0.90	0.05	0.04	0.67	0.08	3.95	4.78	100.00	0.9859
7	495	LIB T32-1	5/22/88	76.58	13.16	0.87	0.03	0.06	0.71	0.05	3.87	4.68	100.01	0.9853
8	1979	WL-5-12 (61.28m) T164-8	12/12/91	76.51	13.26	0.87	0.04	0.05	0.70	0.07	3.76	4.75	100.01	0.9852
9	2709	FLV-194-BC T246-3	08/13/92	76.50	12.97	0.88	0.05	0.05	0.72	0.06	4.00	4.75	99.98	0.9850
10	2944	SS-91-4-5(38)	08/13/92	77.06	12.60	0.90	0.05	0.07	0.70	0.07	3.85	4.69	99.99	0.9846
11	2644	JB-B3-17 T241-8	10/21/91	76.22	13.28	0.84	0.04	0.08	0.70	0.05	4.04	4.76	100.01	0.9835
12	2912	SS-91-4-3(15)	08/13/92	76.36	13.15	0.87	0.07	0.04	0.73	0.05	4.01	4.72	100.00	0.9834
13	191	LD-10, T40-2	08/13/92	76.71	13.04	0.91	0.04	0.03	0.68	0.07	3.80	4.71	99.99	0.9829
14	454	679-340, T31-2	08/13/92	76.57	13.20	0.84	0.03	0.03	0.70	0.04	3.84	4.71	99.99	0.9824
15	2946	SS-91-4-5(47)	08/13/92	76.55	13.03	0.93	0.04	0.00	0.68	0.04	3.91	4.82	100.00	0.9818
16	2950	SS-91-3-2(50)	08/13/92	76.56	13.05	0.92	0.04	0.00	0.71	0.07	4.06	4.59	100.00	0.9816
17	1135	WL-5-13-1.11M T84-12	12/3/84	76.59	13.09	0.89	0.04	0.06	0.71	0.07	3.74	4.82	100.01	0.9813
18	2913	SS-91-4-3(19)	08/13/92	76.73	12.74	0.89	0.05	0.02	0.71	0.08	3.90	4.89	100.01	0.9810
19	2569	JB-B3-6 T227-3	6/13/91	76.39	13.29	0.83	0.04	0.06	0.71	0.06	3.88	4.74	100.00	0.9808
20	574	KRL92082-A, T53-3	03/23/93	76.12	13.32	0.94	0.04	0.04	0.67	0.06	3.95	4.86	100.00	0.9800
21	2924	SS-91-1-2(6)	08/13/92	76.54	12.93	0.92	0.04	0.05	0.67	0.02	4.00	4.83	100.00	0.9792
22	183	KRL7982-19B, T45-4	08/13/92	76.37	13.29	0.83	0.04	0.02	0.71	0.07	3.88	4.79	100.00	0.9791
23	545	KRL7982-17, T50-4	02/01/83	76.61	13.14	0.87	0.03	0.04	0.68	0.05	3.77	4.79	99.98	0.9780
24	1242	WL 6-26 66.33m T93-11	5/2/85	76.65	13.16	0.87	0.05	0.04	0.71	0.05	3.69	4.78	100.00	0.9776
25	2845	FLV-213-LC T261-2	7/14/92	76.14	13.26	0.84	0.04	0.06	0.71	0.05	4.11	4.79	100.00	0.9774

Date of Analysis: 08/13/92

SAMPLE ID: SS-91-4-5(20)

Recalculated to 100%

Raw Probe Data
(FeO to Fe2O3)

Raw Probe Data

SiO ₂	72.845	SiO ₂	76.67
Al ₂ O ₃	12.321	Al ₂ O ₃	12.97
FeO	0.704*1.1113=Fe ₂ O ₃	Fe ₂ O ₃	0.82
MgO	0.036	MgO	0.04
MnO	0.030	MnO	0.03
CaO	0.666	CaO	0.70
TiO ₂	0.026	TiO ₂	0.03
Na ₂ O	3.732	Na ₂ O	3.93
K ₂ O	4.570	K ₂ O	4.81

TOTAL (O)	94 930	TOTAL (N)	95 008	TOTAL (R)	100.00
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[illegible]

	08/13/92	76.67	12.97	0.82	0.04	0.03	0.70	0.03	3.93	4.81	100.00	1.0000
1 2942 SS-91-4-5(20)		76.37	13.29	0.83	0.04	0.02	0.71	0.07	3.88	4.79	100.00	0.9882
2 183 KRU7982-19B, T45-4		76.39	13.29	0.83	0.04	0.06	0.71	0.06	3.88	4.74	100.00	0.9065
3 2569 JB-B8-6 T227-3	6/13/91	76.59	13.19	0.83	0.03	0.05	0.70	0.07	3.73	4.80	99.99	0.9062
4 1982 WL-5-13 (64.49m) T164-11	5/22/88	76.57	13.20	0.84	0.03	0.03	0.70	0.07	3.84	4.71	99.99	0.9056
5 454 679-340, T31-2	10/21/91	76.22	13.28	0.84	0.04	0.08	0.68	0.05	4.04	4.76	100.01	0.9839
6 2644 JB-B8-17 T241-8		76.66	13.17	0.83	0.03	0.02	0.68	0.07	3.91	4.64	100.01	0.9839
7 182 KRU7982-16, T45-3	5/21/88	76.68	13.08	0.82	0.03	0.05	0.66	0.06	3.81	4.78	100.01	0.9836
8 1976 WL-5-6 (40.08m) T164-5	5/21/88	76.71	13.12	0.83	0.05	0.04	0.71	0.06	3.70	4.78	100.00	0.9829
9 1243 WL-6-26 66.40m T93-12	5/2/85	76.60	12.88	0.77	0.04	0.02	0.70	0.08	3.94	4.97	100.00	0.9827
10 2914 SS-91-4-1(51)	08/13/92	76.63	13.06	0.83	0.01	0.01	0.65	0.00	3.99	4.81	99.99	0.9823
11 2947 SS-91-4-5(49)	08/13/92	76.69	13.10	0.82	0.04	0.05	0.66	0.07	3.79	4.78	100.00	0.9818
12 1975 WL-5-6 (39.31m) T164-4	5/21/88	76.69	13.09	0.83	0.07	0.06	0.72	0.11	4.03	4.64	100.02	0.9814
13 2922 SS-91-4-4(38)	08/13/92	76.47	13.09	0.83	0.02	0.05	0.67	0.06	3.85	4.65	100.01	0.9813
14 572 KRU19823, T64-14	09/06/83	76.90	12.98	0.83	0.02	0.05	0.67	0.05	4.11	4.79	100.00	0.9813
15 2845 FLV-213-LC T261-2	7/14/92	76.14	13.26	0.84	0.04	0.06	0.71	0.05	4.05	4.82	100.02	0.9806
16 1974 WL-5-5 (36.93m) T164-3	5/21/88	76.69	13.09	0.83	0.03	0.05	0.66	0.06	3.79	4.81	99.99	0.9802
17 2010 SS-91-4-2(41)	08/13/92	77.06	12.68	0.86	0.01	0.03	0.69	0.04	3.77	4.75	100.00	0.9800
18 1258 WL-4-25 66.79m t95-5	5/29/85	76.94	12.84	0.81	0.05	0.04	0.73	0.07	3.81	4.75	100.00	0.9795
19 2926 SS-91-1-2(17)	08/13/92	76.77	12.98	0.79	0.07	0.13	0.67	0.03	3.84	4.72	100.01	0.9789
20 2909 SS-91-4-2(39)	08/13/92	76.57	12.86	0.82	0.10	0.05	0.70	0.03	3.93	4.85	100.01	0.9786
21 2709 FLV-194-BC T246-3	12/12/91	76.50	12.97	0.88	0.05	0.05	0.72	0.06	4.00	4.75	99.98	0.9784
22 495 IIB, T32-1		76.58	13.16	0.87	0.03	0.06	0.71	0.05	3.87	4.68	100.01	0.9780
23 1959 WL-4-18 (43.53M) T162-13	5/15/88	77.01	12.97	0.82	0.04	0.04	0.67	0.06	3.63	4.77	100.01	0.9780
24 1045 DSDP 36-10-2 SSA, T18-5	07/18/84	76.90	12.80	0.85	0.04	0.04	0.72	0.09	3.73	4.83	100.00	0.9776
25 2913 SS-91-4-4(19)	08/13/92	76.73	12.74	0.89	0.05	0.02	0.71	0.08	3.90	4.89	100.01	0.9775

Date of Analysis: 08/13/92

SAMPLE ID: SS-91-4-5(22)

Recalculated to 100%

Raw Probe Data
(FeO to Fe2O3)

Raw Probe Data

SiO2	73.553	SiO2	76.45
Al2O3	12.515	Al2O3	13.01
FeO	0.844*1.1113=Fe2O3 (.938	Fe2O3	0.97
MgO	0.039	MgO	0.04
MnO	0.040	MnO	0.04
CaO	0.644	CaO	0.67
TiO2	0.092	TiO2	0.10
Na2O	3.690	Na2O	3.84
K2O	4.700	K2O	4.89

TOTAL(R) 100.01

TOTAL(O) 96.115 TOTAL(N) 96.209

Listing of 50 closest matches for COMP. NO. 2943 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 08/17/92												
C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	CaO	TiO2	Na2O	K2O	Total.R	Sim. Co
1	2943 SS-91-4-5(22)	08/13/92	76.45	13.01	0.97	0.04	0.67	0.10	3.84	4.89	100.01	1.0000
2	541 KXL7932-6, T49-6	12/09/82	76.75	12.87	0.96	0.03	0.65	0.06	3.80	4.86	100.02	0.9881
3	543 KXL7982-8, 12/09/82	12/09/82	76.68	13.00	0.97	0.02	0.64	0.05	3.84	4.77	100.00	0.9878
4	700 LD-10*		76.45	13.13	0.97	0.04	0.65	0.08	3.71	4.91	100.00	0.9872
5	2933 SS-91-1-1(11)	08/13/92	76.05	13.33	1.00	0.01	0.68	0.11	3.88	4.92	100.01	0.9049
6	2946 SS-91-4-5(47)	08/13/92	76.55	13.03	0.93	0.04	0.68	0.04	3.91	4.82	100.00	0.9848
7	574 KXL92082-A, T53-3	03/25/83	76.12	13.32	0.94	0.04	0.67	0.06	3.95	4.86	100.00	0.9846
8	517 KXL7982-E, T50-2	02/01/83	76.77	12.99	0.98	0.05	0.66	0.06	3.69	4.76	100.00	0.9839
9	2917 SS-91-4-4(15)	08/13/92	76.23	13.18	0.99	0.01	0.66	0.01	3.90	4.90	99.99	0.9817
10	2924 SS-91-1-2(6)	08/13/92	76.54	12.93	0.92	0.04	0.67	0.02	4.00	4.83	100.00	0.9814
11	2712 FLV-197-BC T246-6	12/12/91	76.46	12.98	0.98	0.04	0.65	0.06	4.02	4.77	100.01	0.9813
12	544 KXL7982-14, T50-3	02/01/83	76.58	13.06	1.00	0.03	0.65	0.05	3.88	4.71	100.00	0.9807
13	2952 SS-91-1-8(48)	08/13/92	76.55	13.06	0.90	0.07	0.66	0.07	3.78	4.85	100.01	0.9807
14	1953 WL-4-10 (23.25M) T162-7	5/15/88	76.70	13.03	0.95	0.05	0.69	0.08	3.57	4.89	100.01	0.9792
15	2375 KXL880-60AB T201-5	10/12/89	76.67	13.17	0.93	0.02	0.66	0.04	3.69	4.80	100.01	0.9782
16	191 LD-10, T40-2		76.71	13.04	0.91	0.04	0.68	0.07	3.00	4.71	99.99	0.9704
17	176 KXL7982-5, T44-5		76.67	12.93	0.98	0.03	0.60	0.05	3.93	4.87	100.00	0.9703
18	1978 WL-5-7 (51.83m) T164-7	5/21/88	75.54	13.66	0.98	0.07	0.68	0.14	4.01	4.87	100.00	0.9702
19	2948 SS-91-1-7(27)	08/13/92	76.50	13.05	0.86	0.04	0.67	0.08	3.81	4.93	100.01	0.9778
20	2916 SS-91-4-4(8)	08/13/92	76.64	13.10	0.99	0.04	0.65	0.09	3.89	4.59	100.02	0.9777
21	2711 FLV-196-BC T246-5	12/12/91	76.65	12.88	0.90	0.05	0.67	0.08	3.95	4.78	100.00	0.9775
22	712 LD-60*		76.58	13.13	0.97	0.04	0.62	0.08	3.71	4.81	99.99	0.9774
23	496 IIR-1, T32-2		76.70	13.13	0.99	0.03	0.65	0.05	3.69	4.72	100.01	0.9773
24	2909 SS-91-4-2(39)	08/13/92	76.57	12.86	0.92	0.10	0.70	0.03	3.93	4.85	100.01	0.9769
25	2945 SS-91-4-5(43)	08/13/92	76.60	12.91	0.91	0.06	0.68	0.08	3.96	4.75	100.00	0.9758

SAMPLE ID: SS-91-4-5(38)

Date of Analysis: 08/13/92

Raw Probe Data Raw Probe Data Recalculated to 100%

SiO2	74.788	SiO2	77.06
Al2O3	12.230	Al2O3	12.60
FeO	0.786*1.1113=Fe2O3	Fe2O3	0.90
MgO	0.050	MgO	0.05
MnO	0.070	MnO	0.07
CaO	0.684	CaO	0.70
TiO2	0.069	TiO2	0.07
Na2O	3.735	Na2O	3.85
K2O	4.548	K2O	4.69
TOTAL(O)	96.960	TOTAL(N)	97.047
		TOTAL(R)	99.99

Listing of 50 closest matches for COMP. NO. 2944 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 08/17/92

C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total, R	Sim. Co
1	2944 SS-91-4-5(38)	08/13/92	77.06	12.60	0.90	0.05	0.07	0.70	0.07	3.85	4.69	99.99	1.0000
2	1259 *WL 4-26 66.87m t95-6	5/29/85	77.01	12.69	0.88	0.04	0.04	0.73	0.09	3.81	4.71	100.00	0.9857
3	756 BO-5		76.29	13.42	0.90	0.04	0.06	0.70	0.08	3.80	4.71	100.00	0.9853
4	2941 SS-91-4-5(15)	08/13/92	76.34	13.25	0.90	0.03	0.03	0.70	0.07	3.95	4.73	100.00	0.9846
5	2913 SS-91-4-3(19)	08/13/92	76.73	12.74	0.89	0.05	0.02	0.71	0.08	3.90	4.89	100.01	0.9843
6	191 LD-10, T40-2		76.71	13.04	0.91	0.04	0.03	0.68	0.07	3.80	4.71	99.99	0.9842
7	2939 SS-91-4-5(6)	08/13/92	77.04	12.72	0.95	0.05	0.03	0.71	0.03	3.77	4.70	100.00	0.9834
8	2910 SS-91-4-2(41)	08/13/92	77.06	12.68	0.86	0.01	0.03	0.69	0.04	3.81	4.81	99.99	0.9833
9	2909 SS-91-4-2(39)	08/13/92	76.57	12.86	0.92	0.10	0.05	0.70	0.03	3.93	4.85	100.01	0.9831
10	495 IIB, T32-1		76.58	13.16	0.87	0.03	0.06	0.71	0.05	3.87	4.68	100.01	0.9827
11	2945 SS-91-4-5(43)	08/13/92	76.60	12.91	0.91	0.06	0.05	0.68	0.08	3.96	4.75	100.00	0.9817
12	2711 FLV-196-BC T246-5	12/12/91	76.65	12.88	0.90	0.05	0.04	0.67	0.08	3.95	4.78	100.00	0.9810
13	1257 *WL 4-26 66.68m	5/29/85	76.78	12.82	0.88	0.05	0.05	0.75	0.07	3.86	4.73	99.99	0.9799
14	1136 WL-5-13-1.11M T04-12	12/3/84	76.59	13.09	0.89	0.04	0.06	0.71	0.07	3.74	4.82	100.01	0.9793
15	454 679-340, T31-2		76.57	13.20	0.84	0.03	0.03	0.70	0.07	3.84	4.71	99.99	0.9791
16	1979 WL-5-12 (61.28m) T164-8	5/22/88	76.51	13.26	0.87	0.04	0.05	0.70	0.07	3.76	4.75	100.01	0.9790
17	2940 SS-91-4-5(7)	08/13/92	76.31	13.15	0.92	0.02	0.04	0.71	0.11	3.93	4.82	100.01	0.9775
18	2921 SS-91-4-4(36)	08/13/92	76.88	12.80	0.87	0.07	0.02	0.66	0.06	3.93	4.72	100.01	0.9773
19	2709 FLV-194-BC T246-3	12/12/91	76.50	12.97	0.88	0.05	0.05	0.72	0.06	4.00	4.75	99.98	0.9762
20	2946 SS-91-4-5(47)	08/13/92	76.55	13.03	0.93	0.04	0.05	0.68	0.04	3.91	4.82	100.00	0.9761
21	573 KDL91982-K, T64-15	09/06/83	76.84	13.01	0.90	0.02	0.00	0.66	0.06	3.70	4.75	99.99	0.9761
22	588 PMR-1, T54-12	07/xx/83	77.00	12.77	0.86	0.13	0.07	0.72	0.13	3.88	4.44	100.00	0.9754
23	1998 WL-5-57 (144.18m) T165-13	5/22/88	77.70	11.93	0.88	0.05	0.08	0.71	0.09	3.76	4.82	100.02	0.9753
24	2950 SS-91-3-2(30)	08/13/92	76.56	13.05	0.92	0.04	0.00	0.71	0.07	4.06	4.59	100.00	0.9750

SAMPLE ID: SS-91-4-5 (47)

Date of Analysis: 08/13/92

Raw Probe Data
Raw Probe Data
(FeO to Fe2O3)

Recalculated to 100%

SiO2	72.747	SiO2	76.55
Al2O3	12.381	Al2O3	13.03
FeO	0.799*1.1113=Fe2O3	Fe2O3	0.93
MgO	0.042	MgO	0.04
MnO	0.000	MnO	0.00
CaO	0.642	CaO	0.68
TiO2	0.036	TiO2	0.04
Na2O	3.717	Na2O	3.91
K2O	4.576	K2O	4.82

TOTAL (O)	94.941	TOTAL (N)	95.030	TOTAL (R)	100.00
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Listing of 50 closest matches for COMP. NO. 2946 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 08/17/92

C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total, R	Sim. Co
1	2946 SS-91-4-5(47)	08/13/92	76.53	13.03	0.93	0.04	0.00	0.68	0.04	3.91	4.82	100.00	1.0000
2	2924 SS-91-1-2(6)	08/13/92	76.54	12.93	0.92	0.04	0.05	0.67	0.02	4.00	4.83	100.00	0.9904
3	2945 SS-91-4-5(43)	08/13/92	76.60	12.91	0.91	0.06	0.05	0.68	0.08	3.96	4.73	100.00	0.9902
4	2909 SS-91-4-2(39)	08/13/92	76.97	12.86	0.92	0.10	0.05	0.70	0.03	3.93	4.85	100.01	0.9893
5	2940 SS-91-4-5(7)	08/13/92	76.31	13.15	0.92	0.02	0.04	0.71	0.11	3.93	4.82	100.01	0.9883
6	574 KRL92082-A, T53-3	03/25/83	76.12	13.32	0.94	0.04	0.04	0.67	0.06	3.95	4.86	100.00	0.9882
7	191 LD-10, T40-2		76.71	13.04	0.91	0.04	0.03	0.68	0.07	3.80	4.71	99.99	0.9877
8	2711 FLV-196-BC T246-5	12/12/91	76.65	12.88	0.90	0.05	0.04	0.67	0.08	3.95	4.78	100.00	0.9870
9	2943 SS-91-4-5(22)	08/13/92	76.45	13.01	0.97	0.04	0.04	0.67	0.10	3.84	4.89	100.01	0.9840
10	2375 KRL880-6048 T201-5	10/12/89	76.67	13.17	0.93	0.02	0.03	0.66	0.04	3.69	4.80	100.01	0.9830
11	2952 SS-91-1-8(48)	08/13/92	76.55	13.06	0.90	0.07	0.07	0.66	0.07	3.78	4.85	100.01	0.9828
12	2941 SS-91-4-5(15)	08/13/92	76.34	13.25	0.90	0.03	0.03	0.70	0.07	3.95	4.73	100.00	0.9818
13	545 KRL7982-17, T50-4	02/01/83	76.61	13.14	0.87	0.03	0.04	0.68	0.05	3.77	4.79	99.98	0.9807
14	180 KRL7982-11L, T44-8		76.76	13.01	0.92	0.02	0.03	0.63	0.04	3.89	4.70	100.00	0.9802
15	455 679-409-6, T31-1		76.71	13.04	0.88	0.03	0.03	0.66	0.07	3.78	4.80	100.00	0.9794
16	541 KRL7932-6, T49-6	12/09/82	76.75	12.87	0.96	0.03	0.04	0.65	0.06	3.80	4.86	100.02	0.9789
17	2913 SS-91-4-3(19)	08/13/92	76.73	12.74	0.89	0.05	0.02	0.71	0.08	3.90	4.89	100.01	0.9789
18	2933 SS-91-1-1(11)	08/13/92	76.05	13.33	1.00	0.01	0.03	0.68	0.11	3.88	4.92	100.01	0.9788
19	178 KRL7982-10, T44-7		76.52	13.08	0.93	0.03	0.04	0.60	0.05	3.91	4.85	100.01	0.9787
20	543 KRL7982-8, 12/09/82	12/09/82	76.68	13.00	0.97	0.02	0.03	0.64	0.05	3.84	4.77	100.00	0.9779
21	1136 WL-5-13-1.11M T84-12	12/3/84	76.59	13.09	0.89	0.04	0.06	0.71	0.07	3.74	4.82	100.01	0.9777
22	573 KRL91982-K, T64-15	09/06/83	76.84	13.01	0.90	0.02	0.05	0.66	0.06	3.70	4.75	99.99	0.9775
23	2917 SS-91-4-4(15)	08/13/92	76.23	13.18	0.99	0.01	0.06	0.71	0.01	3.90	4.90	99.99	0.9771
24	2712 FLV-197-BC T246-6	12/12/91	76.46	12.98	0.98	0.04	0.05	0.65	0.06	4.02	4.77	100.01	0.9770

APPENDIX C
LOW Fe GROUP

The number in parenthesis following the sample identification refers to the original unedited EMA output which for brevity have not been included.

SS-91-1-6(31): Good correlation with: 2) PICO-3 (S.C. 0.9780) the Bailey ash bed from the Ventura Basin, dated at ~1,200,000 y BP; 4) PICO-24 (S.C. 0.9717) the Bishop ash bed from the Ventura Basin, dated at ~758,000 y BP; and, 5) PICO-5 (S.C. 0.9714) the Bailey ash bed also from the Ventura Basin, with the same date as 2 above.

SS-91-1-8(21): Good correlation with: 2) PICO-108 (S.C. 0.9915) (deviation in Mn) the Bailey ash bed from the Ventura Basin, dated at ~1,200,000 y BP; 3) FLV-55-CS (S.C. 0.9899) the Bishop Tuff-younger Mono Glass Mountain group of tephra layers from Fish Lake Valley ranging in age from ~758,000 to ~1,200,000 y BP; 4) TECO-28B (S.C. 0.9842) (deviation in Mn) the Bishop ash bed from ancient Lake Tecopa lake beds dated ~758,000 y BP; 7) TECO-6 (S.C. 0.9821) (deviation in Mn) the Bishop ash bed from ancient Lake Tecopa dated at ~758,000 y BP; and, 8) BT-11D1WL-4-58 (S.C. 0.9817) (deviation in Mn) Bishop ash from near Bishop CA dated at ~758,000 y BP.

SS-91-1-8(26): Good correlation with: 4) PICO-161 (S.C. 0.9863) the Bailey ash bed from the Ventura Basin dated at ~1,200,000 y BP; 5) PICO-24 (S.C. 0.9824) the Bishop ash from the Ventura Basin dated at ~758,000 y BP; 6) PICO-5 (S.C. 0.9819) (deviation in Mg) the Bailey ash bed from the

Ventura Basin dated at ~1,200,000 y BP; 10) DSDP-2 (S.C. 0.9792) the Bishop ash from a Pacific Ocean sediment core from off the coast of Baja California dated at ~758,000 y BP.

SS-91-4-Su(33): Strong correlation with: 5) PICO-107A (S.C. 0.9771) the Bailey ash from the Ventura Basin dated at ~1,200,000 y BP; 8) PICO-4 (S.C. 0.9747) the Bailey ash from the Ventura Basin dated as above; 12) PICO-3 (S.C. 0.9731) the Bailey ash as above; 15) PICO-24 (S.C. 0.9718) the Bishop ash from the Ventura Basin dated at ~758,000 y BP.

SS-91-4-2(5): Correlates to: 3) BT-1 (S.C. 0.9750) the Glass Mountain ash from Bishop CA dated at ~1,100,000 y BP; 6) TECO-28A (S.C. 0.9728) the Bishop ash from Lake Tecopa dated at ~758,000; 7) TECO-7 (S.C. 0.9719) Glass Mountain ash from Lake Tecopa dated at ~1,100,000 y BP; 8) TECO-29 (S.C. 0.917) Glass Mountain ash same as above; and, 9) BT-7 (S.C. 0.9704) Bishop Tuff from Bishop CA dated at ~758,000 y BP.

Date of Analysis: 9/30/92

SAMPLE ID: SS-91-1-6(31)

Recalculated to 100%

Raw Probe Data
(FeO to Fe2O3)

Raw Probe Data

SiO2	72.425	SiO2	76.71
Al2O3	12.356	Al2O3	13.09
FeO	0.662*1.1113=Fe2O3	Fe2O3	0.78
MgO	0.024	MgO	0.03
MnO	0.033	MnO	0.03
CaO	0.474	CaO	0.50
TiO2	0.048	TiO2	0.05
Na2O	3.998	Na2O	4.23
K2O	4.317	K2O	4.57

TOTAL(R) 99.99

TOTAL(N) 94.413

TOTAL(O) 94.337

Listing of 50 closest matches for COMP. NO. 3053 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 9/30/92

C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	MnO	CaO	TiO2	Na2O	K2O	Total.R	Sim. Co
1	3053 SS-91-1-6(31)	9/30/92	76.71	13.09	0.78	0.03	0.03	0.50	0.05	4.23	4.57	99.99	1.0000
2	262 PICO-3, T2-10	9/30/92	77.14	12.92	0.78	0.04	0.05	0.49	0.05	3.89	4.63	99.99	0.9780
3	507 PICO-161, T49-2	12/09/92	77.17	12.83	0.81	0.04	0.03	0.48	0.10	3.96	4.57	100.01	0.9725
4	272 PICO-24, T2-16	9/30/92	77.34	12.89	0.76	0.04	0.03	0.49	0.07	3.04	4.53	99.99	0.9717
5	264 PICO-5(1), T2-7	9/30/92	77.30	12.93	0.77	0.03	0.04	0.40	0.06	3.03	4.55	99.99	0.9711
6	441 PICO-160, T2-15	9/30/92	77.25	12.90	0.76	0.06	0.05	0.40	0.06	3.92	4.51	99.99	0.9711
7	3038 SS-91-3-3(39)	9/30/92	77.15	12.66	0.07	0.00	0.04	0.50	0.07	4.11	4.60	100.00	0.9705
8	3044 SS-91-1-1(18)	9/30/92	76.85	12.81	0.91	0.00	0.07	0.50	0.03	4.27	4.56	100.00	0.9704
9	3056 SS-91-1-8(26)	9/30/92	77.03	12.96	0.81	0.06	0.04	0.49	0.07	3.85	4.68	99.99	0.9693
10	270 PICO-21, T2-8	9/30/92	77.06	13.00	0.79	0.03	0.04	0.47	0.05	3.80	4.67	99.99	0.9686
11	282 PICO-78(1), T37-8	9/30/92	76.41	12.75	0.80	0.03	0.05	0.47	0.06	4.15	4.30	99.02	0.9679
12	279 PICO-73, T39-3	9/30/92	77.29	12.83	0.79	0.03	0.04	0.45	0.06	4.03	4.48	100.00	0.9655
13	19 BHA-SII, T18-8	9/30/92	77.38	12.94	0.74	0.04	0.02	0.48	0.03	4.23	4.12	99.98	0.9650
14	3049 SS-91-4-5(46)	9/30/92	77.19	12.68	0.09	0.03	0.05	0.49	0.01	4.11	4.55	100.00	0.9644
15	2970 SS-91-4-3A	08/17/92	76.96	12.70	0.08	0.03	0.04	0.52	0.05	4.10	4.65	100.02	0.9643
16	2025 KRL-82802-F	7/20/88	77.46	12.28	0.06	0.03	0.05	0.50	0.05	4.11	4.68	100.02	0.9639
17	2966 SS-91-3-1A	08/17/92	77.12	12.53	0.05	0.03	0.02	0.49	0.08	4.11	4.77	100.00	0.9632
18	20 BHA-I, T18-10	9/30/92	77.56	12.72	0.76	0.03	0.03	0.47	0.05	3.83	4.56	100.01	0.9631
19	3050 SS-91-4-9u(33)	9/30/92	77.05	12.68	0.75	0.01	0.02	0.50	0.07	3.94	4.98	100.00	0.9625
20	3015 SS-91-1-1Aav9	9/15/92	76.91	12.82	0.09	0.02	0.05	0.51	0.05	4.07	4.67	99.99	0.9624
21	3007 SS-91-1-0A	08/21/92	76.92	12.96	0.05	0.02	0.04	0.51	0.05	3.91	4.74	100.00	0.9623
22	2016 KRL-82802-A	7/20/88	77.24	12.67	0.86	0.03	0.04	0.51	0.05	3.96	4.63	99.99	0.9619
23	2495 FLV-158-SS	12/20/90	76.94	12.89	0.80	0.04	0.04	0.51	0.08	3.80	4.89	99.99	0.9617
24	144 JANDA-328, T2-12	5/10/89	77.42	12.87	0.74	0.04	0.02	0.47	0.05	4.10	4.28	99.99	0.9614
25	2269 T191-1 F3-89-CS#1	5/10/89	77.23	12.76	0.78	0.04	0.06	0.52	0.09	3.74	4.79	100.01	0.9613

SAMPLE ID: SS-91-1-8(21)

Date of Analysis: 9/30/92

Raw Probe Data	Raw Probe Data (FeO to Fe ₂ O ₃)	Recalculated to 100%
SiO ₂	74.156	SiO ₂ 76.91
Al ₂ O ₃	12.472	Al ₂ O ₃ 12.94
FeO	0.636*1.1113=Fe ₂ O ₃	Fe ₂ O ₃ 0.73
MgO	0.000	MgO 0.00
MnO	0.089	MnO 0.09
CaO	0.396	CaO 0.41
TiO ₂	0.047	TiO ₂ 0.05
Na ₂ O	3.700	Na ₂ O 3.84
K ₂ O	4.851	K ₂ O 5.03
TOTAL(O)	96.348	TOTAL(R) 100.00

Listing of 50 closest matches for COMP. NO. 3055 for elements: Na, Al, Si, K, Ca, Fe
 C.No Sample Number Date
 SiO2 Al2O3 Fe2O3 MgO MnO CaO TiO2 Na2O K2O
 Total, R sim. Co

1	3055	99-91-1-0(21)	9/30/92	76.91	12.94	0.73	0.00	0.09	0.41	0.05	3.04	5.03	100.00	1.00000
2	288	PICO-100, T39-5		77.01	12.91	0.73	0.03	0.04	0.42	0.07	3.01	5.07	99.99	0.9915
3	2004	FLV-53-C9, T166-5	7/19/88	77.07	12.99	0.73	0.03	0.07	0.41	0.07	3.66	5.07	100.00	0.9897
4	383	TECO-28B, T11-5		77.00	12.89	0.73	0.04	0.03	0.43	0.06	3.80	5.00	100.00	0.9842
5	2339	FLV-3P-1, T224-5	4/22/91	76.87	12.99	0.71	0.04	0.08	0.41	0.10	3.67	5.13	100.00	0.9841
6	293	PICO-141, T39-7		77.29	12.84	0.73	0.03	0.02	0.42	0.07	3.68	4.91	99.99	0.9830
7	374	TECO-6, T14-1		77.47	12.84	0.73	0.03	0.04	0.41	0.05	3.76	4.67	100.00	0.9821
8	40	BT-11D1, T13-12		77.47	12.75	0.74	0.03	0.04	0.41	0.04	3.76	4.76	100.00	0.9817
9	1024	M1491-100 T75-11	6/23/84	77.50	12.50	0.74	0.03	0.07	0.41	0.04	3.88	4.80	100.00	0.9814
10	1165	WEB-1 T87-11	12/24/84	77.26	12.68	0.76	0.04	0.05	0.41	0.06	3.67	5.09	100.02	0.9800
11	377	TECO-10, T17-1		76.77	13.09	0.78	0.04	0.03	0.42	0.08	3.78	5.01	100.00	0.9799
12	289	PICO-124, T39-6		77.23	12.76	0.76	0.04	0.05	0.40	0.07	3.85	4.83	99.99	0.9793
13	387	TECO-30B-2, T17-9		76.88	13.08	0.74	0.03	0.04	0.44	0.07	3.75	4.98	100.01	0.9790
14	2500	FLV-SP-3 T220-1	1/31/91	77.18	12.76	0.73	0.07	0.07	0.44	0.09	3.71	4.95	100.00	0.9774
15	1731	CHT-3 T137-13	4/21/87	77.55	12.62	0.75	0.05	0.05	0.41	0.06	3.67	4.86	100.02	0.9770
16	2540	FLV-SP-2 T224-6	4/22/91	76.79	13.07	0.71	0.05	0.07	0.44	0.10	3.73	5.02	99.98	0.9770
17	28	BT-1B, T13-4		77.59	12.57	0.74	0.03	0.03	0.40	0.06	3.75	4.83	100.00	0.9769
18	2005	FLV-56-C9 T166-6	7/19/88	77.18	12.83	0.77	0.04	0.06	0.42	0.06	3.72	4.92	100.00	0.9765
19	2574	FLV-161-MI T227-8	6/13/91	77.35	12.80	0.77	0.03	0.07	0.41	0.06	3.82	4.69	100.00	0.9758
20	27	BT-1A, T13-3		77.53	12.65	0.74	0.03	0.04	0.42	0.06	3.72	4.81	99.99	0.9755
21	2084	CPAW-88-3D T172-14	10/16/88	77.45	12.81	0.72	0.03	0.05	0.40	0.04	3.88	4.62	100.00	0.9753
22	2522	FLV-VB-5A T222-2	4/2/91	77.14	12.75	0.72	0.04	0.07	0.44	0.11	3.89	4.85	100.01	0.9753
23	662	BT-1C, T62-10	08/26/83	77.47	12.75	0.73	0.03	0.03	0.43	0.07	3.77	4.72	100.00	0.9753
24	1279	BT-7 BULK 200SEC CT3 T20-1	7/1/85	77.57	12.48	0.73	0.02	0.05	0.43	0.07	3.88	4.78	100.01	0.9749
25	1275	BT-7 (2) BULK T20-1	7/1/85	77.63	12.48	0.74	0.03	0.05	0.42	0.07	3.87	4.71	100.00	0.9744

DATE OF ANALYSIS: 9/30/92

SAMPLE ID: SS-91-1-8 (26)

Recalculated to 100%

Raw Probe Data
(FeO to Fe₂O₃)

SiO₂ 77.03
Al₂O₃ 12.96
Fe₂O₃ 0.81
MgO 0.06
MnO 0.04
CaO 0.49
TiO₂ 0.07
Na₂O 3.85
K₂O 4.68

SiO₂ 74.302
Al₂O₃ 12.503
FeO 0.704*1.1113=Fe₂O₃ 0.782
MgO 0.060
MnO 0.040
CaO 0.473
TiO₂ 0.071
Na₂O 3.712
K₂O 4.515

TOTAL (R) 99.99

TOTAL (N) 96.457

TOTAL (O) 96.379

Listing of 50 closest matches for COMP. NO. 3056 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 9/30/92

C.No	Sample Number	Date	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	MgO	MnO	CaO	TiO ₂	Na ₂ O	K ₂ O	Total, R	Sim. Co
1	3056 SS-91-1-8 (26)	9/30/92	77.03	12.96	0.81	0.06	0.04	0.49	0.07	3.85	4.68	99.99	1.0000
2	262 PICO-3, T2-10		77.14	12.92	0.70	0.04	0.05	0.49	0.05	3.89	4.63	99.99	0.9896
3	270 PICO-21, T2-8		77.06	13.00	0.79	0.03	0.04	0.47	0.05	3.88	4.67	99.99	0.9869
4	587 PICO-161, T49-2	12/09/82	77.17	12.85	0.81	0.04	0.03	0.48	0.10	3.96	4.57	100.01	0.9863
5	272 PICO-24, T2-16		77.34	12.89	0.76	0.04	0.03	0.49	0.07	3.84	4.53	99.99	0.9824
6	264 PICO-511, T2-7		77.30	12.93	0.77	0.03	0.04	0.48	0.06	3.83	4.55	99.99	0.9819
7	2495 FLV-150-S3 T219-5	12/20/90	76.94	12.89	0.80	0.04	0.04	0.51	0.08	3.80	4.89	99.99	0.9810
8	3007 SS-91-1-8A	08/21/92	76.92	12.96	0.85	0.02	0.04	0.51	0.05	3.91	4.74	100.00	0.9807
9	2564 SS-91-1-low Ca SS	8/7/91	77.48	12.59	0.82	0.04	0.04	0.50	0.06	3.72	4.76	100.01	0.9805
10	69 DEXP-2, T9-4		77.69	12.46	0.81	0.05	0.03	0.48	0.08	3.67	4.73	120.00	0.9792
11	2086 CPAW-88-3F T173-1	10/6/80	76.98	12.97	0.83	0.04	0.06	0.45	0.08	3.82	4.77	100.00	0.9777
12	441 23-24-16B, T2-15		77.25	12.90	0.76	0.06	0.05	0.48	0.06	3.92	4.51	99.99	0.9760
13	3045 SS-91-1-7 (3)	9/30/92	76.77	12.97	0.88	0.00	0.03	0.49	0.07	4.02	4.77	100.00	0.9759
14	20 BHA-1, T18-10		77.56	12.72	0.76	0.03	0.03	0.47	0.05	3.83	4.56	100.01	0.9735
15	2016 KRL-82882-A T168-1	7/20/88	77.24	12.67	0.86	0.03	0.04	0.51	0.05	3.96	4.63	99.99	0.9732
16	3047 SS-91-1-7 (26)	9/30/92	76.56	13.17	0.90	0.00	0.09	0.49	0.08	3.94	4.76	99.99	0.9731
17	1884 JT-6387-1 T150-3	11/9/97	77.34	12.89	0.76	0.03	0.07	0.46	0.06	3.01	4.59	100.01	0.9730
18	1885 JT-41186-1 T150-4	9/11/87	77.34	12.89	0.76	0.03	0.07	0.46	0.06	3.81	4.59	100.01	0.9730
19	2966 SS-91-3-1A	08/17/92	77.12	12.53	0.85	0.03	0.02	0.49	0.08	4.11	4.77	100.00	0.9727
20	2269 T191-1 F3-89-CS#1	5/10/89	77.23	12.76	0.78	0.04	0.06	0.52	0.09	3.74	4.79	100.01	0.9726
21	26 BT-1, T2-13		77.32	12.91	0.80	0.03	0.03	0.43	0.05	3.85	4.57	99.99	0.9723
22	2078 CPAW-88-1B T172-8	9/29/88	77.52	12.67	0.78	0.04	0.03	0.49	0.05	3.58	4.84	100.00	0.9718
23	2349 FLV-72-FC T196-5	8/7/89	77.40	12.79	0.77	0.04	0.03	0.50	0.07	3.61	4.78	99.99	0.9716
24	2165 KRL-82982-B T178-1	12/6/80	77.36	12.71	0.87	0.01	0.05	0.52	0.04	3.81	4.63	100.00	0.9715
25	18 BHA-51, T18-9		77.49	12.83	0.72	0.03	0.03	0.49	0.07	3.79	4.54	99.99	0.9712

Date of Analysis: 9/30/92

SAMPLE ID: SS-91-4-Su(33)

Recalculated to 100%

Raw Probe Data
(FeO to Fe2O3)

SiO2 77.05
Al2O3 12.68
Fe2O3 0.75
MgO 0.01
MnO 0.02
CaO 0.50
TiO2 0.07
Na2O 3.94
K2O 4.98

TOTAL(R) 100.00

TOTAL(N) 94.366

TOTAL(O) 94.295

Listing of 50 closest matches for COMP. NO. 3050 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 9/30/92

C.No	Sample Number	Date	SiO2	Al2O3	Fe2O3	MgO	CaO	FeO	Na2O	K2O	Total	R	Sim.	Co
1	3050 SS-91-4-Su(33)	9/30/92	77.05	12.68	0.75	0.01	0.02	0.50	0.07	3.94	4.98	100.00	1.0000	
2	2760 ET-RCD-7 T250-4	2/26/92	76.83	12.85	0.72	0.06	0.06	0.51	0.08	3.91	4.98	100.00	0.9881	
3	2546 UCSB-FS-89-4 T225-4	4/22/91	77.17	12.75	0.73	0.05	0.04	0.48	0.08	3.83	4.88	100.01	0.9797	
4	3042 SS-91-1-3(24)	9/30/92	76.95	12.67	0.86	0.00	0.05	0.50	0.05	3.93	4.99	100.00	0.9776	
5	287 PICO-107A T39-4	9/30/92	77.09	12.73	0.77	0.03	0.04	0.46	0.08	3.89	4.91	100.00	0.9771	
6	2710 FLV-195-BC T246-4	12/12/91	77.39	12.52	0.73	0.05	0.04	0.48	0.05	3.99	4.76	100.01	0.9766	
7	2545 UCSB-FS-89-3-4DE T225-3	4/22/91	77.22	12.69	0.76	0.03	0.04	0.46	0.07	3.96	4.78	100.01	0.9764	
8	263 PICO-4 T1, N-ASW-56, P	4/22/91	77.36	12.33	0.80	0.03	0.05	0.51	0.06	3.83	5.03	100.00	0.9747	
9	2495 FLV-158-99 T219-5	12/20/90	76.94	12.89	0.80	0.04	0.04	0.51	0.08	3.80	4.89	99.99	0.9744	
10	1931 SC-45B T163-5	5/14/80	77.23	12.81	0.73	0.05	0.08	0.49	0.06	3.56	4.98	99.99	0.9741	
11	2759 ET-CFD-1 T250-3	2/26/92	77.07	12.60	0.80	0.04	0.04	0.46	0.09	3.95	4.95	100.00	0.9737	
12	262 PICO-3 T2-18	9/30/92	77.14	12.92	0.78	0.04	0.05	0.49	0.05	3.89	4.63	99.99	0.9731	
13	2349 FLV-72-FC T196-5	0/7/89	77.40	12.79	0.77	0.04	0.03	0.50	0.07	3.61	4.78	99.99	0.9728	
14	2516 FLV-160-C3 T221-5	3/0/91	77.40	12.82	0.73	0.01	0.06	0.50	0.07	3.50	4.91	100.00	0.9720	
15	272 PICO-24 T2-16	9/30/92	77.34	12.89	0.76	0.04	0.03	0.49	0.07	3.84	4.53	99.99	0.9718	
16	441 23-24-16B, T2-15	7/1/05	77.25	12.90	0.76	0.06	0.05	0.48	0.06	3.92	4.51	99.99	0.9713	
17	1201 CF-1 9TLCIC NOLK T100-12	6/24/92	77.10	12.62	0.79	0.05	0.08	0.51	0.11	3.61	5.04	99.99	0.9713	
18	2025 BP-34 T250-3	5/10/89	76.94	12.80	0.74	0.03	0.07	0.47	0.05	3.73	5.16	99.99	0.9713	
19	2269 T191-1 F3-69-CS#1	9/28/88	77.23	12.76	0.78	0.04	0.06	0.52	0.09	3.74	4.79	100.01	0.9709	
20	2078 CPAW-80-1B T172-0	6/24/87	77.52	12.67	0.75	0.04	0.03	0.49	0.05	3.58	4.84	100.00	0.9692	
21	396 TL-111, T46-2	5/22/88	77.24	12.85	0.75	0.03	0.04	0.45	0.07	3.81	4.78	100.00	0.9685	
22	1005 R-1-07, T143-6	5/22/88	77.52	12.67	0.75	0.03	0.03	0.45	0.05	3.93	4.58	100.01	0.9684	
23	1900 WL-5-24 (90.28m) T165-4	5/22/88	77.63	12.32	0.72	0.04	0.07	0.51	0.09	3.60	5.02	100.00	0.9684	
24	274 PICO-39A(2), T20-6	9/30/92	77.47	12.75	0.75	0.03	0.04	0.46	0.05	3.95	4.49	99.99	0.9680	
25	20 BHA-I, T18-10	9/30/92	77.56	12.72	0.76	0.03	0.03	0.47	0.05	3.83	4.56	100.01	0.9675	

Date of Analysis: 9/30/92

SAMPLE ID: SS-91-4-2(5)

Recalculated to 100%

Raw Probe Data
(FeO to Fe₂O₃)

SiO ₂	77.84
Al ₂ O ₃	12.24
Fe ₂ O ₃	0.84
MgO	0.03
MnO	0.02
CaO	0.43
TiO ₂	0.05
Na ₂ O	3.82
K ₂ O	4.74

SiO ₂	74.139
Al ₂ O ₃	11.662
FeO	0.718*1.1113=Fe ₂ O ₃
MgO	0.026
MnO	0.017
CaO	0.410
TiO ₂	0.049
Na ₂ O	3.634
K ₂ O	4.516

0.798

TOTAL(R) 100.01

TOTAL(N) 95.551

TOTAL(O) 95.171

Listing of 50 closest matches for COMP. NO. 3036 for elements: Na, Al, Si, K, Ca, Fe Date of Update: 9/30/92

C.No Sample Number Date SiO₂ Al₂O₃ Fe₂O₃ MgO MnO CaO TiO₂ Na₂O K₂O Total, R Sim. Co

1	3036	SS-91-4-2(5)	9/30/92	77.84	12.24	0.84	0.03	0.02	0.43	0.05	3.82	4.74	100.01	1.0000
2	2086	CRAW-88-3F T173-1	10/6/88	76.98	12.97	0.03	0.04	0.06	0.45	0.08	3.02	4.77	100.00	0.9783
3	26	BT-1, T2-13		77.32	12.91	0.90	0.03	0.03	0.43	0.05	3.05	4.57	92.99	0.9750
4	1023	LTH-DH-15-32.5 T75-10	6/23/84	77.70	12.45	0.74	0.04	0.03	0.43	0.03	3.77	4.71	100.00	0.9740
5	1729	WEB-2 T137-11	4/21/87	77.44	12.50	0.80	0.05	0.06	0.43	0.04	3.69	4.99	100.00	0.9737
6	302	TECO-20A, T17-4		76.74	13.09	0.81	0.03	0.04	0.43	0.06	3.05	4.94	99.99	0.9720
7	375	TECO-7, T14-2		77.09	12.90	0.81	0.03	0.05	0.42	0.06	3.75	4.89	100.00	0.9719
8	384	TECO-29, T17-6		76.68	13.12	0.81	0.04	0.04	0.43	0.07	3.85	4.96	100.00	0.9717
9	1279	BT-7 BULK 200SEC CT9 T20-1	7/1/85	77.57	12.48	0.73	0.02	0.05	0.43	0.07	3.08	4.78	100.01	0.9707
10	1355	29068502 T107-2	8/30/85	78.16	12.15	0.76	0.03	0.04	0.44	0.07	3.72	4.63	100.00	0.9702
11	295	PICO-152, T39-1		76.98	12.97	0.79	0.03	0.06	0.42	0.05	3.89	4.80	99.99	0.9699
12	1275	BT-7 (2) BULK T20-1	7/1/85	77.63	12.48	0.74	0.03	0.05	0.42	0.07	3.87	4.71	100.00	0.9694
13	1354	29068501 T107-1	8/30/85	78.06	12.27	0.76	0.04	0.04	0.44	0.07	3.64	4.67	99.99	0.9691
14	2574	FLV-161-MI T227-8	6/13/91	77.35	12.80	0.77	0.03	0.07	0.41	0.06	3.82	4.69	100.00	0.9683
15	662	BT-1C, T62-10	08/26/83	77.47	12.75	0.73	0.03	0.03	0.43	0.07	3.77	4.72	100.00	0.9678
16	1278	BT-0 (2) BULK T20-2	7/1/85	77.75	12.48	0.73	0.03	0.05	0.44	0.05	3.82	4.65	100.00	0.9670
17	2226	FLV-66-MA T185-1	2/28/89	77.74	12.66	0.75	0.02	0.04	0.43	0.07	3.79	4.51	100.01	0.9670
18	31	BT-7, T20-1		77.54	12.60	0.76	0.03	0.03	0.43	0.07	3.66	4.73	100.00	0.9668
19	663	BT-2, T62-15	08/26/83	77.64	12.67	0.74	0.03	0.03	0.43	0.07	3.66	4.73	100.00	0.9667
20	69	D8DP-2, T9-4		77.69	12.46	0.81	0.05	0.03	0.48	0.08	3.67	4.73	100.00	0.9665
21	2343	FLV-69-PA T195-3	7/21/89	78.04	12.31	0.74	0.02	0.06	0.44	0.05	3.77	4.55	99.98	0.9661
22	2085	CRAW-88-3E T172-15	10/6/88	77.18	12.94	0.80	0.04	0.05	0.39	0.06	3.81	4.74	100.01	0.9657
23	268	PICO-14, T1, N-ASM-64, P		77.15	12.67	0.83	0.04	0.10	0.43	0.07	3.55	5.16	100.00	0.9655
24	2499	BEC-3-PNICE min fract t219-9	12/20/90	77.57	12.74	0.79	0.03	0.03	0.45	0.06	3.63	4.69	99.99	0.9655
25	2382	FLV-136-NP T203-6	4/16/90	77.86	12.35	0.74	0.03	0.04	0.44	0.08	3.90	4.57	100.01	0.9654