SierraSil®

PROFESSIONAL REFERENCE GUIDE

Version 2017

SierraSil®

The SierraSil® Professional Reference Guide (PRG) is for Canadian health professionals, retailers and others who recommend or sell SierraSil® products. It provides educational and other factual information regarding the proprietary mineral complex SierraSil® found in all of SierraSil® Health Inc.'s products.

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INTRODUCTION

SierraSil® is a unique mineral complex sourced from a pristine deposit located high on the eastern slopes of the US Sierra Mountains. It was first discovered by a gold prospector over thirty years ago who found something more valuable than gold – the natural gift of health. He observed wildlife grazing on a particular deposit and then tried the mineral on his domestic animals. Long story short, people who tried it often reported spectacular results.

Our business was founded in 2003 to commercialize this very special mineral deposit and our simple goal is to help people become healthier and more active.

We strive to be ethical; to treat all people fairly and with respect; and to stand behind our products with operating standards that meet or exceed regulatory requirements. Additionally, verifying safety and supporting health claims with quality first hand research has been very important to us, as is a hassle free consumer satisfaction guarantee. This Professional Reference Guide highlights that research and provides additional supporting documentation.

We welcome your feedback on this PRG or any aspect of our business or our products. Thank you for using and recommending our products.

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PRODUCT DESCRIPTION AND LISTING

SierraSil® is the trade name for a unique mineral complex sourced from a mineral deposit located high on the eastern slopes of the US Sierra Mountains.

Dr. Hayden Murray, Professor Emeritus, Economic Geology, Clays, and Industrial Minerals, Indiana University, an expert in clay and related mineralogy, describes the deposit as an alteration of a volcanic tuffaceous rock as a result of warm acid fluids which came from significant depths to the surface along fractures in the parent tuffaceous rock millions of years ago. "These hydrothermal fluids have altered the feldspar and zeolite minerals to montmorillonite (an absorbent clay), jarosite (a potassium iron sulphate) and hematite (an iron oxide). In addition to the above minerals, quartz (a pure silicon dioxide) and some partially altered feldspars are present as well."

Dr. Murray, who has studied deposits all over the world, said after conducting an X-Ray diffraction analysis "In my more than 50 years of mineral research, I have never seen a combination of minerals like this before".

This mineral structure contains approximately 40 identifiable macro and trace mineral elements. However due to the tightly bound silicate mineral structure, only a portion of the minerals are available to the body. The available minerals per 2 gram serving are (approximate mg): Calcium 23, potassium 20, sodium 12, aluminum 6, phosphorus 3, magnesium 2, iron 1, silicon 1 and the following between 1 mg and 0.01 mg: manganese, barium, copper, cobalt, and zinc.

Much of the mineral content is non-soluble except at very low or high pH levels outside the pH range in the human stomach. However, the SierraSil® mineral structure will bind a variety of compounds by either absorbing or adsorbing them (collecting in a thin layer) to its molecular surface. This characteristic supports the detoxifying properties of SierraSil® and why it is NOT recommended to be taken with medications.

PRODUCT NAME	PRODUCT DESCRIPTION	FORMAT
SierraSil® Joint Formula14™ Capsules (JF14)	Two-piece size "0" clear vegetable capsule containing light brown powder	Capsules
SierraSil® Joint Formula Curcumin (JFC)	Yellow-orange powder in "0" v-caps plus clear capsule	Capsules
SierraSil® Joint Formula14 Powder Unflavored	Light brown powder	Powder
SierraSil® Drink Powder – Lemon Lime Flavored	Light brown powder with lemon-lime flavour	Powder
SierraSil® Pain Relief Topical Spray	Spray bottle containing blend of camphor, SierraSil® and essential oils	Spray
SierraSil® Leaps and Bounds™ Soft Chews	Chicken flavored soft chews for dogs	Soft Chew

Serving Guidelines for Joint Formula14™

RECOMMENDED DOSE: (ADULTS) Take 3 capsules once daily with water on an empty stomach. Persons with larger bodies or BMI of over 25 should consider taking 4 or 5 capsules per day, or a larger scoop of the powder.

DIRECTIONS FOR USE: For best results, take SierraSil® Joint Formula14™ (JF14) with water at least one hour before or after a meal or other beverages such as coffee, pop, tea, juice or milk. Take critical medications four hours before or after JF14. JF14 has detoxifying properties due to its clay-like silicate mineral structure, and it is strongly recommended to drink plenty of water for best results with SierraSil®. Increased water intake assists the body in flushing out toxins and heavy metals that are eliminated by the body when using SierraSil®.

SPECIAL CONDITIONS: Athletes and active adults participating in high-intensity exercise can take SierraSil® Joint Formula14™ 1 to 3 hours before activity to aid endurance and recovery and reduce delayed onset muscle soreness (post-exercise stiffness).

For those in weakened conditions, living with multiple pre-existing medical conditions or sensitive stomachs, start with one capsule, once per day and gradually work up to the recommended dose.

For those without sensitive stomachs, if results do not manifest within the first 7 days consider taking a loading dose. A loading dose is double the recommended daily dose for 7 days and can be taken to help increase results.

CAUTIONS AND WARNINGS

CAUTIONS: For a very small percentage of SierraSil® users, the detoxification process can cause some transient discomfort at first, known as a healing reaction, while the body adjusts to SierraSil® Joint Formula14™. A healing reaction is a temporary process that the body endures as it moves towards optimal balance and function (homeostasis). Symptoms of healing reactions vary, and may include headache, changes in bowel movements or a slight stiffening of the joints. These reactions are temporary and normally subside within 1 to 7 days of using SierraSil® Joint Formula14™. If the symptoms are too uncomfortable, lower the dose to 1 capsule or 667 mg daily and gradually increase to the recommended dose. To facilitate the detoxification process, it is critical to consume plenty of water (6+ glasses daily) while taking SierraSil® Joint Formula14™ to assist the body with eliminating toxins. Increased water intake will also reduce the risk of constipation while taking SierraSil.

WARNINGS: Pregnant or nursing women and persons with known medical conditions (such as cardiovascular diseases) should consult with their health care practitioner prior to using SierraSil® Joint Formula14™. SierraSil® Joint Formula14™ should be kept out of reach of children. SierraSil® has not been clinically tested for these population groups.

CONTRAINDICATIONS: SierraSil® Joint Formula14™ should not be taken at the same time of day as critical medications. The absorptive mineral complex in SierraSil® Joint Formula14™ may bind with medications due to its highly absorptive and adsorptive properties.

CLINICAL SUPPORT

Study Abstracts for SierraSil®

SierraSil has made and continues to make a significant investment in research to demonstrate both the safety and efficacy of the SierraSil® ingredient. These studies are summarized as follows:

1. Human pilot study

TITLE: A pilot study to test the safety and efficacy of the mineral supplement SierraSil® in osteoarthritis of the knee.

OBJECTIVE: A pilot study to evaluate the safety and efficacy of SierraSil® in patients suffering from osteoarthritis of the knee. The 2003 study was conducted in a randomized fashion to administer patients diagnosed with moderate osteoarthritis of the knee with SierraSil® alone or SierraSil® plus a proprietary cat's claw herbal extract.

METHODS: Baseline WOMAC scores were established after which the patients received one capsule three times daily of the treatment for 10 days. Post-treatment WOMAC scores and side effects were also recorded. The parameters of the study included WOMAC scores, OA clinical symptoms, stair climb ability, pain and stiffness reduction and quality of life.

RESULTS: 100% of the subjects reported a significant improvement within one week of treatment on either SierraSil® alone or SierraSil® with the cat's claw, with no concomitant medications (i.e. aspirin, acetaminophen) required or side effects reported.

CONCLUSION: This pilot study showed that SierraSil® alone or in combination with cat's claw provided patients (with previously diagnosed osteoarthritis) benefits that were clinically measurable. This pilot study therefore warranted further investigation to determine the biological mechanism of action, the appropriate dosage and SierraSil®'s safety and efficacy in a larger scale clinical trial.

2. Double blind, placebo controlled, OA study

TITLE: Early relief of osteoarthritis symptoms with a natural mineral supplement and a herbo-mineral combination: A randomized controlled trial [ISRCTN38432711]

OBJECTIVE: This study was designed to determine if a natural mineral supplement, SierraSil®, alone and/or in combination with a cat's claw herbal extract (Uncaria guianensis), Vincaria®, has therapeutic potential in mild to moderate osteoarthritis of the knee.

METHODS: 107 patients with mild to moderate osteoarthritis of the knee were randomly

assigned to one of 4 groups in a double-blinded fashion: 1) high dose SierraSil® (3 g/day), 2) low dose SierraSil® (2 g/day), 3) low dose SierraSil® (2 g/day) + Vincaria® (100 mg/day) or 4) placebo, administered for 8 weeks. Primary efficacy variables were WOMAC scores. Secondary variables were: Visual Analog Score (VAS) for pain; consumption of rescue medication (paracetamol); and tolerability. Safety measures included vital signs and laboratory-based assays.

RESULTS: SierraSil® was able to produce significant improvement in WOMAC and VAS scores after 8 weeks ($P < 0.001$) either alone or in combination with Vincaria®. SierraSil® groups also produced a faster onset of benefits (at week 1, 2, and 4) in reference to baseline values when compared to placebo group. At 4 weeks, all the SierraSil groups displayed a 38–43% WOMAC improvement.

CONCLUSION: SierraSil® alone and in combination with cat's claw extract improved joint health and function within 1–2 weeks of treatment. SierraSil® may offer an alternative therapy in subjects with joint pain and dysfunction. See PMID: 16242032 PMCID: PMC1276811 for the peer reviewed, published paper. Journal of Inflammation. J Inflamm (Lond). 2005;2:11.

3. Double blind, placebo controlled, cross-over, OA study

TITLE: A randomized, double blind, placebo controlled cross over study to explore the efficacy and safety of SierraSil® Joint Formula14™ in adults with osteoarthritis of the knee.

OBJECTIVE: The primary objective of this study was to assess the efficacy of SierraSil® at 2 g/day on the symptoms of osteoarthritis as assessed by WOMAC™ Pain subscale in Canadian subjects with osteoarthritis of the knee. Secondary objectives of the study were to determine changes in WOMAC™ osteoarthritis index physical function and stiffness subscales, SF-36 questionnaire scores, inflammatory markers such as hsCRP, TNF, and IL-6, onset of analgesia, amount of rescue medication used, safety parameters including vital signs, adverse events, and laboratory tests.

METHODS: In this randomized, double-blind, placebo controlled, cross over study, a total of 230 subjects were screened and 150 were found to be eligible to participate in the study. 75 subjects went on the SierraSil® treatment and the other 75 on placebo. Of the 150 subjects 25% were of healthy weight while 75% were large or obese by BMI measurement.

RESULTS: Subjects with a WOMAC™ Pain score between 16 and 33.3 mm at baseline showed a decreasing trend in Pain score from baseline to week 4. During the washout period, these subjects' Pain scores increased suggesting efficacy of SierraSil®. Though subjects on placebo had an initial decrease in Pain score from baseline to week 2, an increase was seen by week 4. Subjects with a WOMAC™ Pain score between 66.7 and 100 mm at baseline showed a decreasing trend in Pain score from baseline to week 2 and plateaued by week 4 for both Placebo and SierraSil®. Within groups, subjects on SierraSil® demonstrated statistically significant improvements in SF-36 scores from baseline to week 4 for the domains: Physical Function, Role Limitation due to Physical Health, Vitality/Energy, Social Functioning, and Bodily Pain. Furthermore, subjects on SierraSil® showed statistically significant improvements in Total SF-36 scores, Total Physical Activity and Total Mental Health.

CONCLUSION: The study found that SierraSil® was effective in relieving pain associated with osteoarthritis as indicated by both WOMAC scores and SF-36 scores. SierraSil® was found in this study to be effective in temporary relief of joint pain, with more profound effect in subjects with normal body weight (BMI < 25.00 Kg/m2), suggesting that larger bodies would benefit from a larger dose than 2 g/day. This study was published in the following Dove Press Journal: Open Access Rheumatology: Research and Reviews 3, Oct 2014.

4. Double Blind Placebo Controlled (Cross Over) Pilot Sport Study (Unpublished)

TITLE: SierraSil as an ergogenic aid to performance in athletes.

OBJECTIVE: The purpose of this study was to examine whether Sierrasil® could improve anaerobic power in a group of well-trained athletes. A secondary purpose was to examine the effect of Sierrasil® on the severity of delayed onset muscle soreness (DOMS).

METHODS: 10 male, varsity football players were studied in a double-blind, cross-over design. The athletes (mean age= 22 years; height= 183.6 cm; weight = 90.3 kg) performed three Wingate cycle ergometer tests 5 minutes apart as a test of peak power, average power and fatigue index. They recorded DOMS on a 0-10 visual analogue scale (VAS) at 24, 48 and 72 hours post-exercise. Prior to exercise and 5 minutes following the last Wingate test, blood was taken for analysis of selected cytokines. The athletes were randomly assigned to Sierrasil® or placebo groups for three weeks and, following a three-week washout period, the experimental treatments were reversed. The products were dispensed according to the manufacturer's recommendation.

RESULTS: All athletes completed the trial. Sierrasil® was well tolerated by highly trained male athletes. There were no adverse effects reported. Following Sierrasil® supplementation the peak power increased by 33.8 W (a 3% increase) and mean power by 6.7 W (a 1% increase). In the placebo group the peak power decreased by 11.2 W (-2.6%) and the mean power decreased by 17.2 W (-1%). DOMS values on the VAS were higher in the placebo group at 24, 48 and 72 hrs post-exercise (P= 3.2, 2.2, 1.3 vs. Sierrasil®= 2.5, 1.6, 0.6). There were no statistically significant changes in the performance measures between the two groups however (p>0.05). There were no significant changes in the cytokine measures following supplementation with either Sierrasil® or placebo.

CONCLUSION: The results showed that Sierrasil® is safe to use in highly trained athletes and resulted in improvements in anaerobic power and in reducing the level of DOMS post-exercise that the researchers, Dr. Don McKenzie and Dr. Jack Taunton describe as "sport significant".

5. Toxicology and chelation study

TITLE: The Toxicology and Potential Chelating Effect of SierraSil®.

OBJECTIVE: A pilot study led by Dr. James Lavalle designed to assess potential for accumulation of toxic minerals in humans and to reveal if SierraSil® has a chelating effect on toxic metal accumulation.

METHODS: 12 subjects entered the study designed to examine the effects of SierraSil® on 16 potentially toxic metals and 19 essential elements over a 6-month period.

RESULTS: 7 subjects completed the study. The data reveals that arsenic levels appear to rise from T0 to T3 (and from T0 to T6). However, they declined from T3 to T6, although this change was not statistically significant. All the measurements for arsenic levels remained within the normal reference range. If the arsenic in SierraSil® was bioaccessible, then the levels should have continued to rise. As a natural chelating agent, ingestion of SierraSil® caused a 56.9% decrease in lead between T0 and T6, and a 62.7% decrease between T3 and T6, both of which were statistically significant at the 5% level.

CONCLUSION: It appears that daily ingestion of SierraSil® at 4 g/day may have a profound effect on the lowering of lead levels and may have the potential to lower the risk of the adverse health effects associated with lead exposure.

6. Long term user medical analysis

TITLE: Long term user medical analysis by Dundarave Medical Clinic, West Vancouver, BC, Canada.

OBJECTIVE: This laboratory analysis was conducted to examine the blood chemistry and other health indicators of patients who have been taking SierraSil® over a long period of time (2 to 5 years).

METHODS: A full laboratory analysis was conducted on 9 patients with a mean age of 60.1 years with the range of 41–85 years old. The average use of SierraSil® in this study was 2–4 capsules per day for a minimum of 2 years. Haematology, general blood chemistry, adrenal function and serum proteins were included in the laboratory analysis.

RESULTS: Lab analysis showed that these patients have normal to low-normal profiles of parameters described above, for instance, the cortisol is averaging 350.38 nmol/L when the normal range is 140 – 690 nmol/L, showing that adrenal function of the 9 patients was healthy. A more important and more relevant testing was the C - reactive protein (CRP) as it relates to inflammatory processes in the body. The average CRP level of the 9 patients was 2.2 mg/L where the normal range is < 5.0 mg/L. this again shows that SierraSil® may have anti- inflammatory properties in patients suffering from osteoarthritis; however OA markers were not included in this lab analysis.

CONCLUSION: Patients who are on long term use of SierraSil® were found to have a healthy and normal biochemistry profile when compared to the established normal ranges.

7. Mechanism of Action Study

TITLE: Suppression of Human Cartilage Degradation and Chondrocyte Activation by a Unique Mineral Supplement (SierraSil®) and a Cat's Claw Extract, Vincaria®.

OBJECTIVE: This study investigated the hypothesis that the unique clay-based mineral supplement SierraSil® alone, and in combination with an extract of cat's claw, Vincaria®, could limit human cartilage degradation-activated chondrocytes.

METHODS: The investigative model used was human cartilage tissue, obtained at the time of knee surgery. SierraSil® was subjected to neutral, alkali, and acid washes, followed by neutralization before addition to cartilage explants or cultured chondrocytes (0.05, 0.1, and 0.2 µg/ml). Vincaria®, an alkaloid depleted aqueous extract of cat's claw (Uncaria Guianensis) was studied in combination with SierraSil® (2.5, 5 and 10 ng/ml).

RESULTS: Chondrocytes were activated with the addition of the inflammatory cytokine interleukin-1 (5 ng/ml). Measured outcomes were media nitrate/nitrite levels as an index of nitric oxide production, and media glycosaminoglycan (GAG) concentrations as an index of matrix breakdown. Following neutral or alkali washes, a small reduction in GAG release was observed with neutral extracts ($p<0.05$). The combination of SierraSil® + Vincaria® significantly reduced both GAG and nitric oxide release under these conditions. Following an acid wash to mimic passage of the material through the stomach, SierraSil® alone significantly reduced IL-1-induced GAG release by 68–73% ($p<0.01$) and SierraSil® + Vincaria® by 58–77% ($p<0.01$). Production of NO by human chondrocytes was also reduced by acid-washed SierraSil® alone ($p<0.05$) and was more pronounced with the SierraSil® + Vincaria® combination ($p<0.01$). IL-1-induced nitric oxide production and GAG release is known to reflect the activation of inducible pathways (inducible nitric oxide synthase and matrix metalloproteases).

CONCLUSION: The attenuation of these events suggests that SierraSil alone or in this herbo-mineral combination limits cartilage destruction by curtailing these transcriptional events in chondrocytes. Results suggest that this nutraceutical-based therapeutic agent may offer a new approach to limiting joint destruction and immobility associated with arthritis.

Published in The Journal of the American Nutraceutical Association. Volume 7, No. 2, 2004

8. Ames test

TITLE: Review of SierraSil® Bacterial Reverse Mutation (AMES) Test.

OBJECTIVE: SierraSil® mineral was tested in bacterial reverse mutation assay for its potential to induce point mutations in S. typhimurium strains TA-98, TA-100, TA-1535, TA-1537 and E. coli strain WP2 uvrA. The experimental design followed the OECD guideline for testing of chemicals– 471, bacterial reverse meutation test (1997).

METHODS: The powder was stored at room temperature during the study. A large portion of it was insoluble in common solvents that were compatible with the assay. The insoluble material precipitated in the testing agar plates and interfered with colony counting. In the main studies, the sample was prepared in DMSO and water by shaking at 45oC for two days. Exposure concentrations were expressed in “mg eq. per plate”. “Mg eq.” represented the number of mg from which the extract was prepared. DMSO extracted SierraSil® was tested in a plate incorporation assay; water extract, in pre-incubation assay.

RESULTS: Bacterial toxicity was observed in all strains exposed to DMSO extracts with S9. This limited the maximum exposure concentrations to 2.07 mg eq. per plate for this part of the study. With the addition of S9, exposure to as high as 56.00 mg eq. per plate of DMSO extract did not cause obvious toxicity. Water extract was largely non-toxic with or without S9. Maximum extractable concentration was in this case included in the exposure concentrations that ranged from 0.55 to 44.40 mg eq. per plate. All tester strains showed only background level of reversion at any exposure concentration with either extract. The observed means for triplicate plates of each concentration was largely within the range of the means ± 2 SD of the corresponding solvent controls.

CONCLUSION: It was concluded that the mineral was not mutagenic to S. typhimurium strains TA-98, TA-100, TA-1535, TA-1537 and E. coli strain WP2 uvrA under the test conditions.

9. Acute oral toxicity (AOT)

TITLE: Review of SierraSil® acute oral toxicity test.

ABSTRACT: The acute oral toxicity study completed on SierraSil® found that the acute oral LD50 of SierraSil® to be in excess of 2000.0 mg/Kg body weight. No effects of toxicity or mortality were observed at any point during the 14 days of testing. The animals gained weight during the test. Post-testing examination showed no gross pathological findings in any of the five rats.

10. Sub-acute oral toxicity (SAOT)

TITLE: Repeated dose 90-day oral toxicity study with 28-day recovery period of SierraSil® in Sprague Dawley rats (OECD Protocol 408).

OBJECTIVE: The study was to assess the toxicological profile of SierraSil® when rats are exposed daily to the test article over a period of 90 days, by oral gavage.

METHODS: Groups of 10 male and 10 female Sprague Dawley rats were administered SierraSil® by oral gavage daily at the doses of 100 mg, 550 mg or 1000 mg per kg body weight for 90 days and were sacrificed on day 91 to evaluate its toxicity. Concurrent control group receiving vehicle at 10 ml/kg was also maintained. Additionally, groups of 5 rats per sex receiving vehicle at 10 ml/kg and the test article at 1000 mg/kg levels were further observed for a period of 28 days following 90 day exposure, for assessment of reversibility, persistence or delayed occurrence of toxicity.

RESULTS: There was no treatment related mortality among rats exposed to SierraSil® at all three doses. No findings indicative of neurotoxic potential of the treatment were reported. Body weight gain by treatment group was found to be comparable to that by the control group. Food consumption was also comparable between the treatment group and control group. Haematology, clinical chemistry, urinalysis, organ weights, gross pathology and histopathology all revealed no significant difference between treatment group and placebo group.

CONCLUSION: Based on the findings of this study, the no-observed-adverse-effect-level (NOAEL) of SierraSil® in Sprague Dawley rats, following oral administration for 90 days was found to be more than 1000 mg/kg body weight (equivalent to about 35 times the recommended dosage/serving).

11. SAOT liver analysis

TITLE: Repeated dose 90-day oral toxicity study with 28-day recovery period of SierraSil® in Sprague Dawley rats.

OBJECTIVE: The study was to address body weight and liver chemistry analysis of rats that had been fed SierraSil® over a period of 90 days by oral gavage.

METHODS: In the same study as described previously, liver samples for rats treated with SierraSil® were prepared and analyzed as it is a safe assumption that hepatic metal content is reflective of levels in other tissues of the animal.

RESULTS: Total iron content of the liver, total lead content of the liver, total arsenic content of the liver and total aluminum content of the liver were analyzed in 10 rats from the control group and 10 rats from the high dose group (1000 mg/kg body weight of SierraSil®). The weight of the liver was also compared between control and high dose groups. No statistically significant difference was found in any of the above liver analyses.

CONCLUSION: Even at very high dosages there was no accumulation of metals tested in the liver, even a trend to lower lead levels.

12. Radiation protection

TITLE: Effect of SierraSil® hydrothermal mineral complex (HMC317) on [3H-Methyl] Thymidine uptake in human liver (THLE-2), human normal skin (NHEM) and human melanoma skin cells (A375).

OBJECTIVE: This study was to investigate the effect of SierraSil® on [3H-Methyl] Thymidine uptake as a measure of radiation absorption by various human cells.

METHODS: An in vitro assay was designed to measure the uptake of [3H-Methyl] Thymidine by three human cell lines: human liver (THLE-2), human normal skin (NHEM) and human melanoma skin cells (A375). SierraSil® powder dissolved in complete growth media provided ~2.4% soluble solids in the filtrate that were used in the assay. [3H-Methyl] Thymidine at concentrations of 0.5, 0.1 and 0.05 µCi were tested at 24, 48 and 72 hours after incubation with the test product.

RESULTS: After 24 hours of incubation there was a significant decrease in the amount of radiation detected in THLE-2 cells exposed to all three concentrations of [3H-Methyl] Thymidine in the presence of SierraSil® compared to control liver cells. After 24 hours of incubation there was a significant decrease in the amount of radiation detected in NHEM cells exposed to 0.05 µCi of [3H-Methyl] Thymidine in the presence of SierraSil® compared to control normal skin cells. After 72 hours of incubation, there was a significant decrease in the amount of radiation detected in A375 cells exposed to 0.05 µCi of [3H-Methyl] Thymidine in the presence of SierraSil® compared to control melanoma cells.

CONCLUSION: Analysis of the data showed that cells cultured in the presence of SierraSil® powder demonstrated lower incorporation of [3H-Methyl] Thymidine compared to cells cultured in the absence of SierraSil®. The study also established that the absorption of radiation in the form of [3H-Methyl] Thymidine is dose, time and cell type dependent.

13. Bio-accessibility testing

TITLE: Dissolution Testing of SierraSil® USP <711>

OBJECTIVE: This experiment is conducted to determine if metals from the SierraSil® product are bioaccessible following digestion with simulated gastric and intestinal fluids at physiological temperature (37°C).

METHODS: The test protocol follows the Dissolution method <711> described in USP 24 NF-19. The experiment was conducted in a water bath at 37 ± 2°C. All materials were cleaned and rinsed according to standard procedure. Both digestive solutions – gastric fluid and intestinal fluid – were prepared according to the USP 24 NF-19 method. The bioaccessibility of metals in the test sample was estimated using the equation: [concentration of a given metal determined in the chime] / [concentration of the given metal determined in the SierraSil® sample before digestion x 100%].

RESULTS: The mean concentration of mercury was 0.213 ± 0.004 µg/0.667g. However, the mean bioaccessibility of mercury was 1.4%. The concentration of lead in the test sample was 4.3 ± 0.04 µg/0.667g, while the bioaccessibility was 0%. The bioaccessibility of cadmium was 108%, however, the concentration of cadmium in the test sample, 0.03 ± 0.002 µg/0.667g, was very close to the limit of detection (0.02 µg/0.667g).

CONCLUSION: The estimated daily intake for elements of potential concern, based on an expected consumption of three 0.667g-capsules per day (containing a total of 2g of SierraSil®), showed that the concentrations of mercury, lead and cadmium in the sample were extremely low and came well within the limits of Health Canada regulations.

14. N of 1 Study

TITLE: N of 1 Study assessing soreness in a healthy adult male.

OBJECTIVE: Dr. James McCormack, UBC Title, offered to supervise a double blind, placebo controlled, multiple cross over N of 1 Study to assess the efficacy of SierraSil JF14 in a healthy SierrraSil customer, challenging placebo effects and speed of benefits.

METHODS: Eight bottles of a two week supply (4 each of placebo and treatment) were randomized on a double blind basis. The adult male patient kept a log of activity and noted soreness on a scale of 1 to 7 with definitions for each as established by Dr. McCormack. For example 1, represented no soreness to 7 which represented very severe soreness, cannot be ignored and markedly limits daily activity and often requires rest.

RESULTS: The patient soreness scores ranged from 1 (no soreness) to 4 (moderate soreness - cannot be ignored but does not influence my daily activities). The average soreness score (per bottle/2 week blocks) on treatment was 1.29 and the average soreness score on placebo was 2.13, a difference of 0.84 (placebo soreness 65% higher than treatment). All treatment score averages were lower than any of the placebo score averages. This is significant given the nature of the study, with what turned out to be 5 transitions from either placebo to treatment or treatment to placebo in the 16 week period, suggesting that the onset of benefits was rapid when on treatment, but there was similarly short 'tail' to the benefits.

CONCLUSIONS: For the patient in this double blind, placebo controlled multiple cross-over study, SierraSil JF14 significantly reduced soreness associated with activity such as running and other exercise.

FREQUENTLY ASKED QUESTIONS

WHO IS SIERRASIL® JOINT FORMULA 14™ INTENDED FOR?

SierraSil® is recommended for adults suffering from sore joints or stiffness. Particular benefits are for the following:

- *Athletes seeking improved peak power and reduced delayed onset soreness (DOMS).*
- *Boomers seeking to better enjoy activity with reduced joint discomfort and stiffness.*
- *Seniors seeking to regain or maintain independence with increased agility in fingers and reduced discomfort and stiffness in all joints including shoulders, knees, hips, and reduced 'morning stiffness' throughout the body.*

SierraSil® may also aid digestive health, reduce acid reflux and support faster recovery of certain injuries such as rotator cuff and carpal tunnel. However, these are anecdotal observations and have not yet been studied clinically.

SierraSil® is not recommended for people on numerous medications, as SierraSil®'s detoxifying properties may partially absorb these medications. It is also not recommended for pregnant or nursing women as it has not been clinically tested in this population.

HOW DOES SIERRASIL® JOINT FORMULA 14™ WORK?

We know from published in vitro research at Case Western Reserve University that SierraSil® moderates inflammation and curtails cartilage breakdown. These results are consistent with those of the human clinical studies. SierraSil® may also help to detoxify the body, an inference that can be reasoned based on the studies completed.

WILL SIERRASIL® JOINT FORMULA 14™ HELP WITH ARTHRITIC SYMPTOMS?

Clinical and anecdotal evidence confirms that SierraSil® Joint Formula14™ is likely to provide noticeable benefits for symptoms of arthritis within two weeks. SierraSil® Joint Formula14™ reduces inflammation, down-regulates specific enzymes involved in the inflammatory process and reduces cartilage breakdown which are factors leading to the development of arthritic symptoms. Human studies confirm these findings for osteoarthritis, showing that SierraSil® Joint Formula14™ significantly improves joint health and function within a 2-week period. In addition, many consumers report significantly reducing their use of pain medications such as NSAIDs while using SierraSil®. SierraSil® was awarded United States patents in 2009 and in 2011 as a nutritional supplement for osteoarthritis.

CAN PATIENTS WITH SENSITIVE STOMACHS TAKE SIERRASIL® JOINT FORMULA 14™?

In case of sensitive stomach, patients should start with 1 capsule per day, gradually increasing the number of capsules to the recommended dose over 14 days. People with GI conditions such as acid reflux, gas, bloating, constipation, leaky gut syndrome, IBD, colitis, diverticulitis, IBS and Crohn's disease have been reporting benefits from taking SierraSil® Joint Formula14™. The mineral structure of SierraSil® Joint Formula14™ has detoxifying properties that may help to cleanse and promote a healthy digestive system and possibly protect the stomach lining.

CAN PATIENTS TAKE SIERRASIL® JOINT FORMULA 14™ WHILE ON MEDICATION OR OTHER NATURAL SUPPLEMENTS?

It is recommended for patients to discuss their supplements and medications with medical advisors prior to using any new products including SierraSil® Joint Formula14™. SierraSil® Joint Formula14™ is a pure natural mineral that has been extensively tested for safety and is NOT known to have adverse effects. Please refer to the dosage guidelines. Patients should take critical medications at least 4 hours before or after SierraSil® Joint Formula14™. Contact customer service at 1-877-743-7720 or info@sierrasil.com if you have questions on the best time of day to take SierraSil® Joint Formula14™.

IS SIERRASIL® JOINT FORMULA 14™ BENEFICIAL AND SAFE FOR ATHLETES?

Yes. SierraSil® Joint Formula14™ is routinely tested and is free of banned substances as listed by the World Anti-Doping Agency (WADA). Testing is done independently and certified by Informed Choice (www.informed-choice.org). SierraSil® Joint Formula14™ eases joint and muscle aches, reduces stiffness and helps prevent cartilage breakdown associated with exercise and movement. SierraSil® has also been endorsed by numerous amateur and professional athletes. A pilot double blind, cross-over, placebo controlled study with elite athletes suggests that SierrSil Joint Formula 14 may offer "sport significant" increased peak power and reduced Delayed Onset Muscle Soreness (DOMS).

IS SIERRASIL® JOINT FORMULA 14™ SUITABLE FOR MOST DIETARY REQUIREMENTS OR PREFERENCES?

SierraSil® Joint Formula14™ is 100% vegetarian and vegan compatible, and all capsules are VegiCaps™. SierraSil® Joint Formula14™ is GMO free and contains no sugar, starch, salt, wheat, gluten, corn, flavoring* or preservatives. The SierraSil® mineral ingredient is also BC Kosher certified.

**with the exception of lemon-lime powder.*

WHY IS THERE AN IRON WARNING ON THE LABEL FOR SIERRASIL® JOINT FORMULA 14™?

There is approximately 120 mg of total iron content per serving of SierraSil® Joint Formula14™; however studies indicate that only about 1.2 mg of iron or approximately 7% of the recommended daily iron intake is bioaccessible. There is a required warning on the labels of all ingested products to protect against young children (under the age of 6) accidentally consuming an entire bottle of iron-containing supplements and possibly experiencing harmful side effects. SierraSil® Joint Formula14™ has been tested at up to 70 times the recommended dosage in accordance with standardized procedures and shown to have no indications of toxicity.

IS THERE ALUMINUM IN SIERRASIL®?

Yes, there is. The bioaccessible amount is less than 10mg per daily dose. This is a fraction of the aluminum content of commonly consumed products such as antacids, baked

goods and cheeses. Most of the aluminum in SierraSil® is tightly bound to the silicate fraction that passes through the body with no chance for absorption. Furthermore there is evidence that even at extended levels of 35 times the recommended SierraSil® dosage or serving that there is no accumulation of aluminum. Aluminum is the third most abundant element on earth and is part of most of what we eat.

HOW IS SIERRASIL® JOINT FORMULA 14™ DIFFERENT FROM OTHER NATURAL JOINT HEALTH PRODUCTS?

Most natural health products provide ingredients that are building blocks of human cartilage or joint structure. These include glucosamine, condroitin, fatty acids, hyaluronic acids, collagen and so forth. In theory these products supplement the body's natural regenerative process. SierraSil® and some herbs are among the joint health ingredients that calm the underlying inflammation. SierraSil® can be complimentary to other ingredients or products but the collection of SierraSil® attributes make it stand out. These attributes include:

- *SierraSil, when taken as directed, has very high efficacy rates – most patients will feel results.*
- *SierraSil usually provides reductions in aches or stiffness quickly. Often within a few days but guaranteed within 14 days (or money back).*
- *SierraSil calms the underlying inflammation, giving the body a better chance to heal itself.*
- *SierraSil appears to assist peak power and reduce delayed onset muscle soreness.*
- *SierraSil may have additional benefits such as detoxifying.*
- *SierraSil is suitable for most dietary types, including diabetics, vegans and celiac sensitivities.*
- *SierraSil is mineral based, requiring no pesticides, fertilizers or solvents in its production.*
- *SierraSil is suitable for those mindful of radius sourcing, as it is one of the few joint health products entirely sourced and produced in North America.*

HOW SHOULD SIERRASIL® JOINT FORMULA 14™ BE TAKEN?

4 Keys to note:

- *Take away from critical medications.*
- *Drink plenty of water.*
- *Larger people benefit from increasing dosage.*
- *Best results when taken away from food.*

HOW LONG HAS SIERRASIL® BEEN MARKETED TO CONSUMERS?

SierraSil® has been marketed since 2004 (following years of "non-commercial" use). There have been millions of servings of SierraSil®.

HOW DOES SIERRASIL ENSURE CONSISTENCY FROM BATCH TO BATCH?

Product consistency is an important part of Sierrasil Health Inc's commitment to Quality. There are 4 levels of testing that are carried out from the mining of the raw material to the final release of the finished product.

Level 1 Testing: Before Sierrasil Health Inc mines the raw hydrothermal mineral complex that is to be used in the SierraSil products, we confirm the consistency and quality of the material by testing samples obtained from the mine. The testing includes electronic and physical assays, and X-ray diffraction, to confirm that the mineral composition matches the SierraSil mineral complex specifications. There is also microbial contamination testing, to ensure the purity of the material. Only when our Mine Operations group is assured of the quality and consistency of the sampled material by verifying that test results meet the established specifications, will the mining commence.

Level 2 Testing: Before the raw material can be used in the manufacture of finished products, it is milled using standardized procedures. To ensure that these specifications are met, samples from each batch of the milled material are tested for composition, bioaccessibility, microbial contamination, heavy metal impurities, particle size and density. The results must meet the established specifications before the milled batches can be approved by Sierrasil Health Inc's Quality Assurance group for use in the finished product.

Level 3 Testing: Once the raw material is approved for use by Sierrasil Health Inc's Quality Assurance group, it is shipped to our GMP-certified and quality-approved contract manufacturers where the material is inspected and re-tested against their internal quality specifications. Upon approval by their Quality Assurance group, the material is then used to make the SierraSil bulk products. More controls are in place during the manufacturing and packaging processes of the bulk and finished products. Quality-approved master production instructions are in place for the manufacture and packaging of the products and each batch of SierraSil products are made according to these standardized instructions. This is to ensure that product consistency is maintained from batch to batch, meeting our quality specifications and the label claims for which they have been approved by regulatory authorities. After the bulk product is manufactured, it is tested. Only if all results meet the specifications will the bulk product be packaged into the final packaging.

Level 4 Testing: At the stage where the bulk product is packaged into final packaging, another round of microbial testing is conducted to provide verification that no possible microbial contamination occurred during the packaging process. Once this is confirmed with satisfactory test results, the product can then be released from our manufacturers.

However, before Sierrasil Health Inc approves the product for sale to the public, our Quality Assurance Group reviews all documentation from the manufacturers and confirms that all required testing has been completed and no issues arose during the manufacture and packaging of the products. With the satisfaction that the finished products are made to the established procedures and meet all of Sierrasil Health Inc's quality standards, SierraSil Health Inc's
Quality Assurance will approve the finished product batch to be made available for sale.

IS OR CAN SIERRASIL BE EXPOSED TO UNDESIRABLE SOLVENTS, PESTICIDES OR OTHER UNINTENDED INGREDIENTS FROM SOURCE TO FINISHED PRODUCT?

There are no pesticides, fertilizers or solvents used in the production of SierraSil.

SierraSil is mined in a remote area a substantial distance away from industrial or agricultural activity and free from any airborne or ground sourced pollutants. SierraSil is then mined, handled and processed with operational procedures to keep it clean and pure. SierraSil is thoroughly tested and third party verified.

WHAT OTHER CLINICAL STUDIES IN SIERRASIL HEALTH INC. UNDERTAKING?

SierraSil has recently entered into a 24 month research agreement with UBC Food Sciences department. The next phase of research will include mechanism of action research to better understand the bioaccesibility of the minerals, how SierraSil passes through the digestive system, how it interacts with other medications and supplements and some preliminary research on how SierraSil affects inflammation of the digestive tract.

It is known that SierraSil can inhibit joint inflammation, however, there is no current information on its effectiveness to inhibit intestinal inflammation. We have a number of customers who have reported better digestion and relief from IBS and Chrohn's symptoms and we look forward to learning more about this through what's known as an in vitro inflamed intestinal cell model to investigate the effectiveness.

The bioaccesibility and drug interaction component of the research are to further understand the pharmacokinetics of SierraSil. We know through previous research that SierraSil is absolutely safe for long term use and this research will further add to that. We currently advise customers to take SierraSil away from medication because of the detoxifying properties of SierraSil, and with an abundance of caution advise that 4 hours should be allowed both before and after taking SierraSil. The research will help clarify if the 4 hour window is necessary and will help us better understand the chelating effect of the mineral. The method used is known as Caco-2 monolayer to investigate the effects of SierraSil on the bioavailability of drugs and natural health products.

SierraSil®

Thank You!

SierraSil's Joint Formula 14 180 capsules are the best-selling joint care item in Canada!*

- Calms inflammation and gently detoxifies the body
- Backed by quality human clinical trials + patented as a nutritional supplement for OA
- Trusted by tens of thousands of Canadians every month

We couldn't have done it without our loyal customers. Thank you for your trust and ongoing support, we're grateful for the opportunity to serve you. We want to make a difference in the lives of Canadians and always welcome your feedback.

Yours in health,

- The SierraSil Team

*source: The Nielsen reports for 52 weeks ending Dec. 10th 2016.

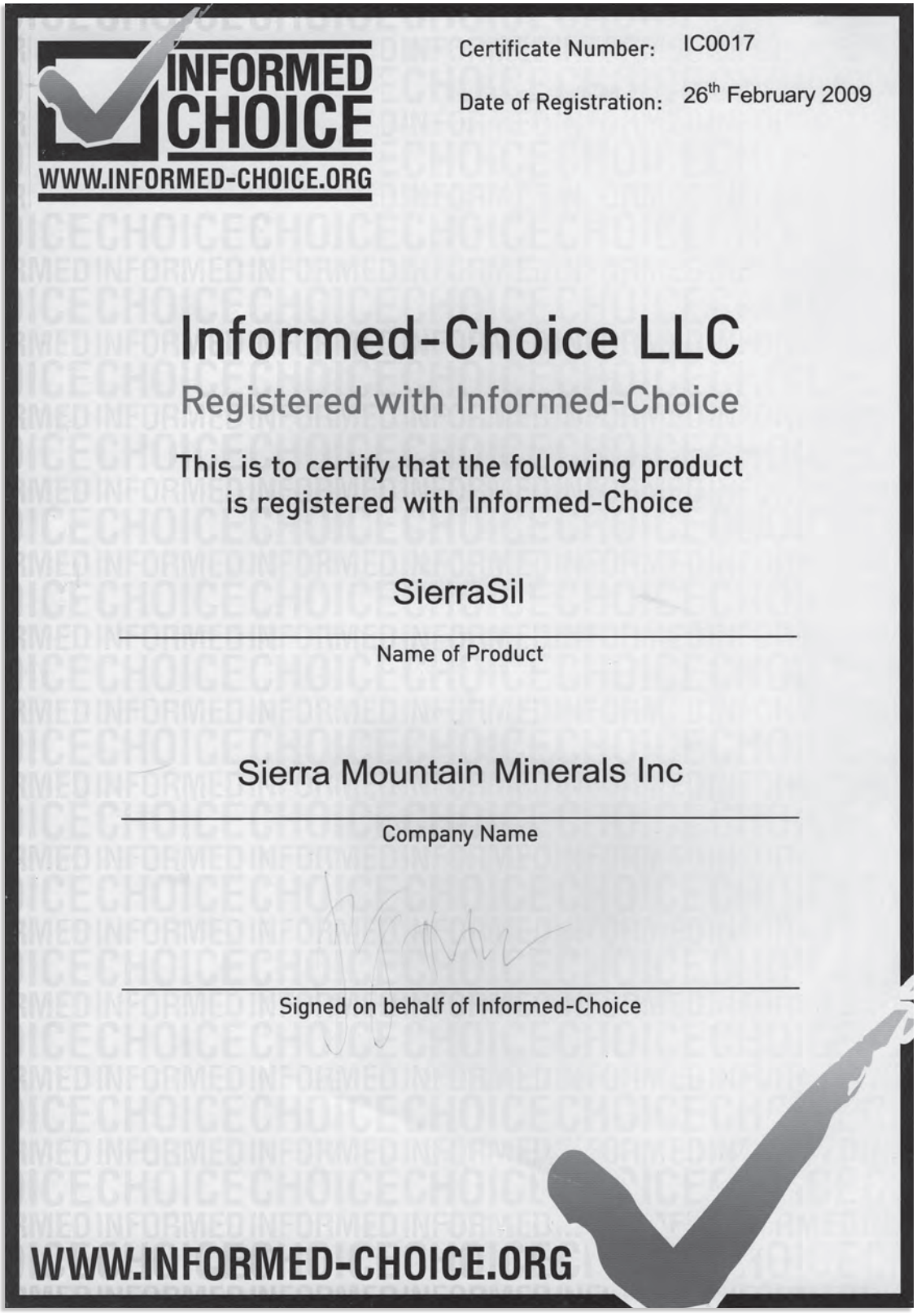
www.sierrasil.ca

INFORMED CHOICE CERTIFICATION

SierraSil® is certified by HFL Sport Science to be a safe product that is free from banned substances and meets the strict requirements of the World Anti-Doping Agency (WADA), and has been awarded Informed Choice certification. HFL Sport Science has over 40 years' continuous experience in the science of sports doping control. This includes experience testing within the framework of the World Anti-Doping Agency (WADA) and testing human and animal food supplements for substances prohibited in sports. Their highly qualified team of scientists delivers both operational screening services and innovative research into prohibited substance detection.

Together, the studies, testing and certification performed by HFL provide sound evidence of SierraSil®'s safety for use by the general public as well as those whose professions require certification of absence of banned substances. Please refer to the attached Informed Choice certificate.

INFORMED CHOICE CERTIFICATE



INFORMED CHOICE
WWW.INFORMED-CHOICE.ORG

Certificate Number: IC0017

Date of Registration: 26th February 2009

Informed-Choice LLC

Registered with Informed-Choice

This is to certify that the following product is registered with Informed-Choice

SierraSil

Name of Product

Sierra Mountain Minerals Inc

Company Name

Signed on behalf of Informed-Choice

WWW.INFORMED-CHOICE.ORG

SAMPLE HFL LETTER

HFL SPORT SCIENCE

HFL Sport Science, Inc.
1745 Alysheba Way
Suite 160
Lexington, KY 40509
859-721-0180
859-264-0371

Caroline Eve
Sierra Mountain Minerals Inc
1501 West Broadway, Suite 400
Vancouver, BC
V6J 4T6
Canada

Date Issued: March 26, 2013

CERTIFICATE OF ANALYSIS: 2275

HFL Supplement Screen

Consignment Number:	1Z662F4X6646887249 UPS Express
Delivery Date:	March 21, 2013
Date Analysis Commenced:	March 21, 2013
Purchase Order Number:	N/A

Product:	Joint Formula 14		
Flavor:			
Batch No:			
Batch Expiry:	12/2016	**HFL Reference:**	44985

The sample was analyzed using documented ISO17025 accredited HFL screening methods for the compounds specified within the Service Level Agreement: Nutritional Supplements V1.3.4.

GCMS:
None were found

LCMS:
None were found

Signed

Todd Branch
Senior Scientist

Test results apply to the portion of product taken.
* or isomers of - as specified within the service level agreement

Page 1 of 1

SAMPLE CERTIFICATE OF ANALYSIS SIERRASIL®

SierraSil

FINISHED PRODUCT SPECIFICATIONS CERTIFICATE OF ANALYSIS

Revision No: 02	Date: 16 April 2013

Product Code: JF14-CAN	**NPN** : 80039305	**Shelf Life**: 36 months
Product Name: SierraSil® Joint Formula 14 (180 Capsules)		
Date of Manufacture: Jan 2013	**Expiry Date**: Dec 2016	
Storage Conditions: Packaging and storage: Store below 30 degrees Celsius. Avoid direct heat and sunlight		

Upon Completion of the Results and Analyst sections of this Product Specification and upon release of Quality Control and Quality Assurance, it is considered to be a completed Certificate of Analysis

IDENTITY:			
Test Description	**Method**	**Parameters**	**Results**
Appearance	Visual	Beige powder in "0" v-caps plus clear capsule	Conforms
PERFORMANCE TESTS:			
Average Capsule Weight	USP <2091>	840 mg (798 – 882 mg)	832 mg
Weight Variation	Modified USP <2091>	+/- 10%	-8.41% - 6.01%
Disintegration	USP <2040>	NMT 30 minutes	19 minutes
PURITY:			
Test Description	**Method**	**Parameters**	**Results**
Total Bacterial Count	USP <2021>	NMT 3000 cfu/g	15 cfu/g
Yeast & Mold	USP <2021>	NMT 300 cfu/g	Yeast: < 15 cfu/g Mold: 10 cfu/g
E.Coli	USP <2022>	Absent/10g	Absent/10g
Salmonella	USP <2022>	Absent/10g	Absent/10g
S.aureus	USP <2022>	Absent/10g	Absent/10g
CHEMICAL CONTAMINANTS			
Arsenic	ICP-MS	NMT 3.97 ppm	0.26 ppm
Cadmium	ICP-MS	NMT 2.38 ppm	0.064 ppm
Lead	ICP-MS	NMT 3.97 ppm	2.36 ppm
Total Mercury	ICP-MS	NMT 7.94 ppm	0.59 ppm

QUANTITY/POTENCY:				
Test Description	**Method**	**Label Claim**	**Parameters**	**Results**
Hydrothermal Mineral Complex	Input	667 mg	Not assayed. This product is manufactured to contained 100% of the label claim for Hydrothermal Mineral Complex	Conforms

CANADA NPN – JF14 CAPSULES

2013/01/30 8:48:08 AM 4/5

Health Canada / Santé Canada

Product Licence
Licence de mise en marché

Product Number/*Numéro de produit*: 80009305
Brand Name/*Marque nominative*: SierraSil® Joint Formula
Issued to/*Émise à*:
Name of licensee/*Nom du titulaire*:

Sierra Mountain Minerals, Inc.
1501 West Broadway, Suite 400
Vancouver, British Columbia, V6J 4Z8
Canada

Authorized for the following/*Autorisé pour ce qui suit*:

Dosage form/*Forme posologique*: Capsule
Recommended route of administration/Voie *d'administration recommandée*:

Oral
Recommended dose/*Dose recommandée*:

Adults: Take 3 capsules once per day with water on an empty stomach at least one half-hour before a meal or other medications/ supplements or two hours after meal or other medications/ supplements.

Recommended duration of use/*Durée d'utilisation recommandée*:

Consult a health care practitioner for use beyond 8 weeks.

Recommended use or purpose/*Usage ou les fins recommandés*:

Used in the temporary relief of joint pain.

Risk Information/*Renseignements sur les risques*:

Cautions and Warnings

Pregnant or nursing women or person with known medication conditions should consult with their physician before using this or any dietary supplement. Keep out of reach from children. There is enough iron in this product to seriously harm a child. If symptoms persist or worsen, consult a health care practitioner. Stop use and consult a health care practitioner if you develop skin lesions, unusual skin pigmentation, irritation of gastrointestinal tract, or changes in cardiac rhythm. Do not use if you have cardiovascular disorder.

Medicinal Ingredients/*Ingrédients médicinaux*:

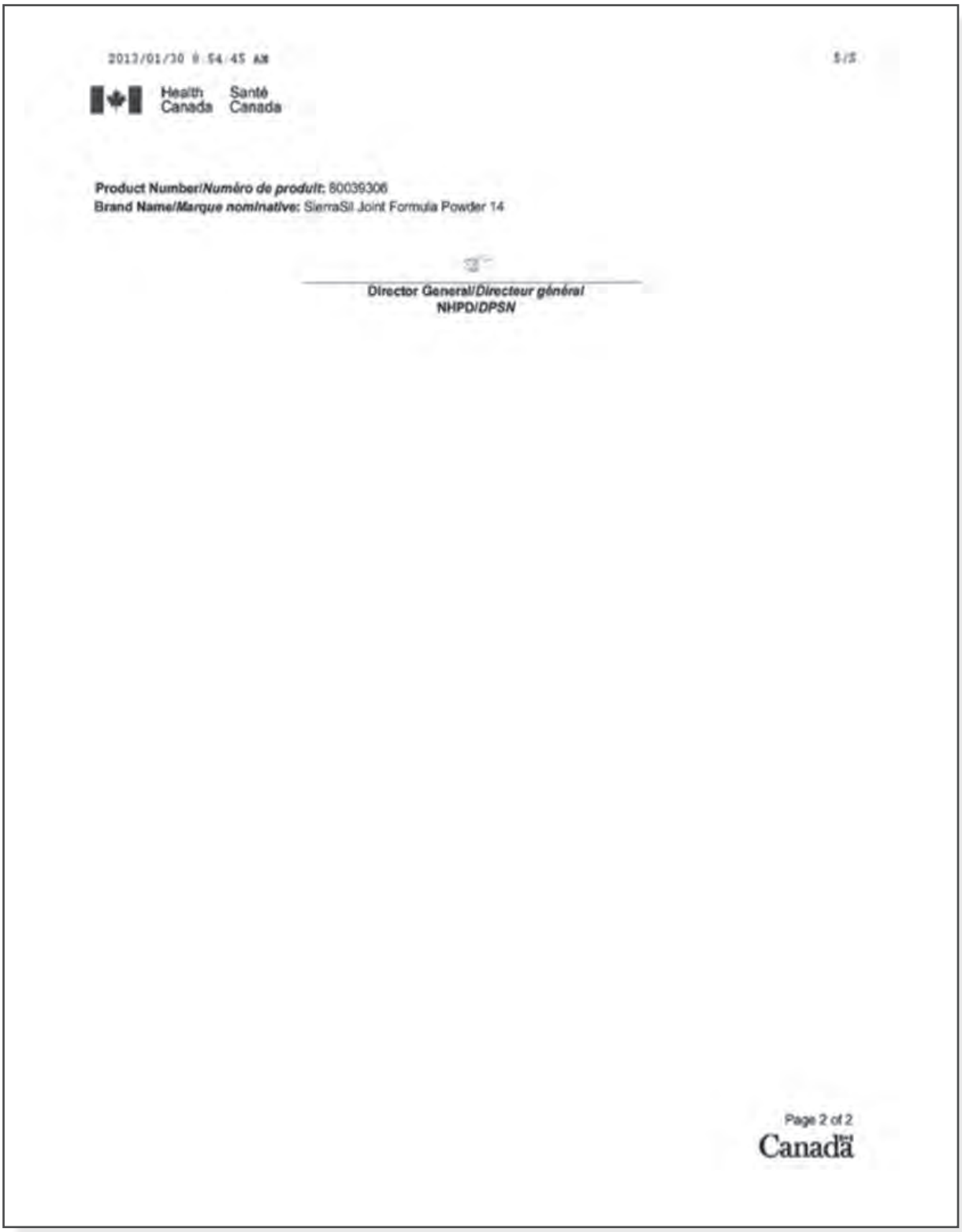
Proper Name / Nom propre	Common Name / Nom usuel	Quantity per Dosage Unit / *Quantité par unité posologique*	Extract / *Extrait*	Potency / *Activité*	Source Material / *Matière d'origine*
SierraSil® Mineral complex	SierraSil® Mineral complex	667 mg	N/A	N/A	Clay

This licence is issued by the Minister of Health under the authority of section 7 of the Natural Health Products Regulations. Sale of the described natural health product, including any changes thereto pursuant to section 11 of the Regulations, is subject to the Food and Drugs Act and to the Natural Health Products Regulations.
Cette licence est émise par la ministre de la Santé en vertu de l'article 7 du Règlement sur les produits de santé naturels. La vente du produit de santé naturel décrit dans la présente, y compris toute modification afférente au sens de l'article 11 du Règlement, est assujettie à la Loi sur les aliments et drogues et au Règlement sur les produits de santé naturels.

Issued/Émis le: 2013-01-30	Revised/Amended/Modifié le: N/A

Page 1 of 2
Canada

CANADA NPN – JF14 CAPSULES CONT'D



2013/01/30 8:54:45 AM 5/5

Health Canada / Santé Canada

Product Number/*Numéro de produit*: 80039306
Brand Name/*Marque nominative*: SierraSil Joint Formula Powder 14

Director General/*Directeur général*
NHPD/*DPSN*

Page 2 of 2
Canada

CANADA NPN – JF14 POWDER

2013/01/30 8:54:08 AM 4/5

Health Canada / Santé Canada

Product Licence
Licence de mise en marché

Product Number/*Numéro de produit*: 80039306
Brand Name/*Marque nominative*: SierraSil Joint Formula Powder 14
Issued to/*Émise à*:
Name of licensee/*Nom du titulaire*:

Sierra Mountain Minerals, Inc.
1501 West Broadway, Suite 400
Vancouver, British Columbia, V6J 4Z8
Canada

Authorized for the following/*Autorisé pour ce qui suit*:

Dosage form/*Forme posologique*: Powder
Recommended route of administration/Voie *d'administration recommandée*:

Oral
Recommended dose/*Dose recommandée*:

Adults : Take 1 level scoop (2 g) once per day with water on an empty stomach at least one half-hour before a meal or other medications/ supplements or two hours after meal or other medications/ supplements.

Recommended duration of use/*Durée d'utilisation recommandée*:

Consult a health care practitioner for use beyond 8 weeks.

Recommended use or purpose/*Usage ou les fins recommandés*:

Used in the temporary relief of joint pain.

Risk Information/*Renseignements sur les risques*:

Cautions and Warnings

Pregnant or nursing women or person with known medication conditions should consult with their physician before using this or any dietary supplement. Keep out of reach from children. There is enough iron in this product to seriously harm a child. If symptoms persist or worsen, consult a health care practitioner. Stop use and consult a health care practitioner if you develop skin lesions, unusual skin pigmentation, irritation of gastrointestinal tract, or changes in cardiac rhythm. Do not use if you have cardiovascular disorder.

Medicinal Ingredients/*Ingrédients médicinaux*:

Proper Name / Nom propre	Common Name / Nom usuel	Quantity per Dosage Unit / *Quantité par unité posologique*	Extract / *Extrait*	Potency / *Activité*	Source Material / *Matière d'origine*
SierraSil® Mineral complex	SierraSil® Mineral complex	2 g	N/A	N/A	Clay

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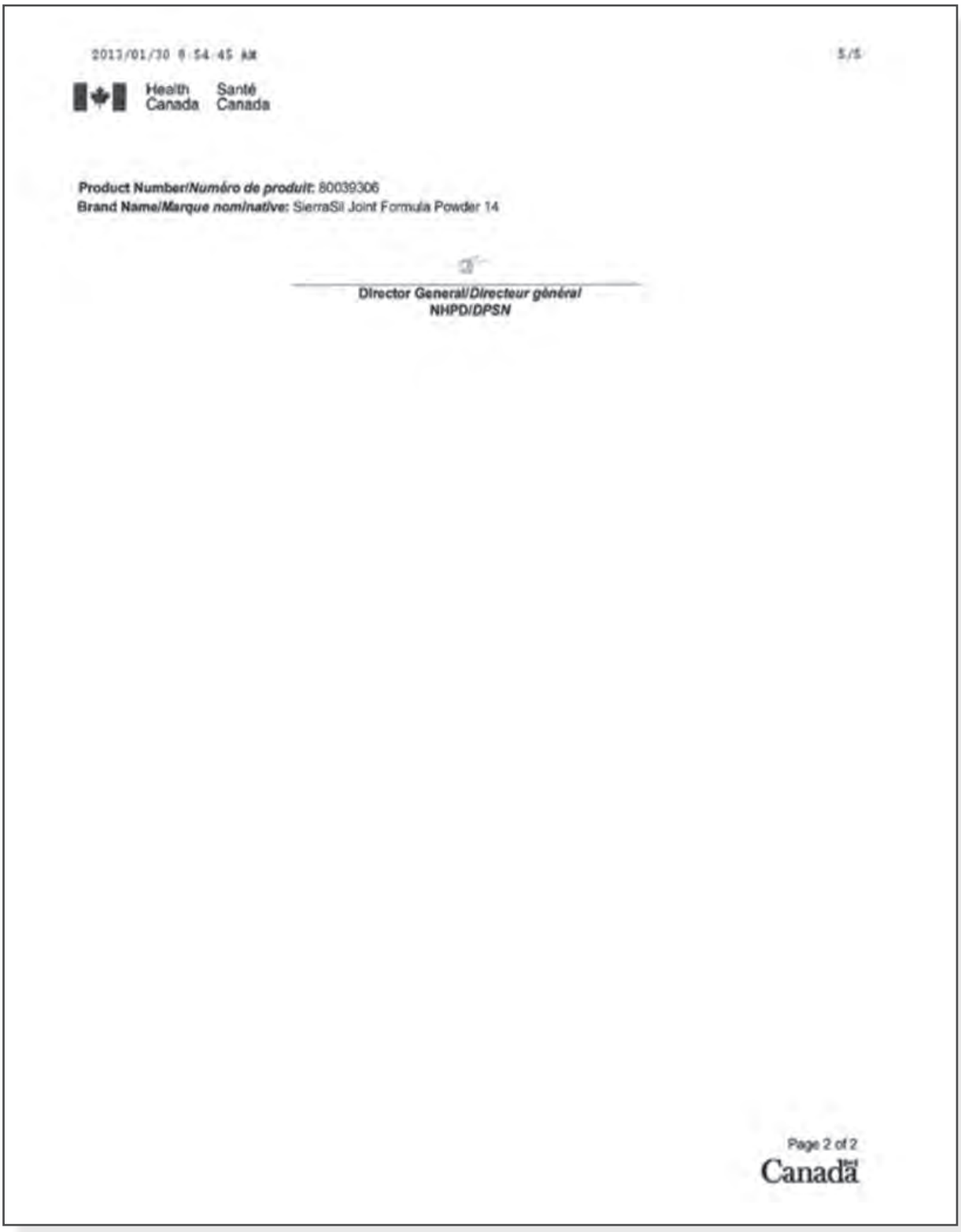
Cette licence est émise par la ministre de la Santé en vertu de l'article 7 du Règlement sur les produits de santé naturels. La vente du produit de santé naturel décrit dans la présente, y compris toute modification afférente au sens de l'article 11 du Règlement, est assujettie à la Loi sur les aliments et drogues et au Règlement sur les produits de santé naturels.

Issued/émis le: 2013-01-30	Revised/Amended/Modifié le: N/A

Page 1 of 2
Canada

CANADA NPN – JF14 POWDER CONT'D



2011/01/30 8:54:45 AM 5/5

Health Canada Santé Canada

Product Number/*Numéro de produit*: 80039306
Brand Name/*Marque nominative*: SierraSil Joint Formula Powder 14

Director General/*Directeur général*
NHPD/*DPSN*

Page 2 of 2

Canada

CANADA NPN – TOPICAL SPRAY

Health Canada / Santé Canada

Product Licence
Licence de mise en marché

Product Number/*Numéro de produit*: 80038018
Brand Name/*Marque nominative*: SierraSil Pain Relief Topical Spray
Issued to/*Émise à*:
Name of licensee/*Nom du titulaire*:

Sierra Mountain Minerals, Inc.
1501 West Broadway, Suite 400
Vancouver, British Columbia, V6J 4Z6
Canada

Authorized for the following/*Autorisé pour ce qui suit*:

Dosage form/*Forme posologique*: Spray
Recommended route of administration/*Voie d'administration recommandée*:

Topical

Recommended dose/*Dose recommandée*:

Adults : Take 1 spray 3-4 times a day. Shake well before using.

Recommended duration of use/*Durée d'utilisation recommandée*:

N/A

Recommended use or purpose/*Usage ou les fins recommandés*:

Temporarily relieves minor aches and pains of muscles and joints associated simple backache, arthritis, strains, bruises and sprains.

Risk Information/*Renseignements sur les risques*:

Cautions and Warnings

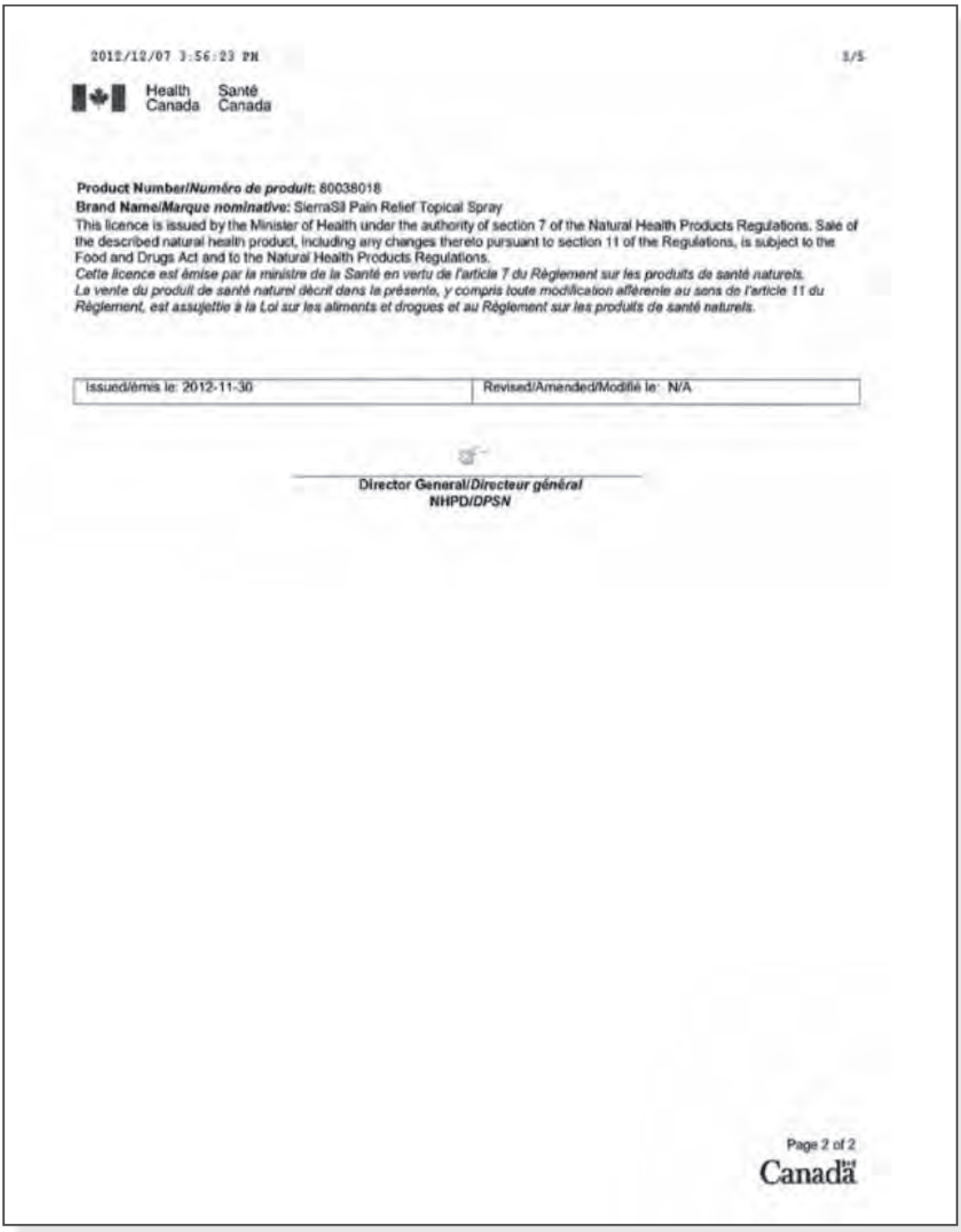
FOR EXTERNAL USE ONLY. When using this product, use only as directed. Do not use with a heating pad. Do not apply to wounds, damaged, broken or irritated skin, or bandage tightly. Avoid contact with eyes and mucous membranes. Consult a physician if conditions worsen, symptoms last for more than 7 days, or if symptoms clear up and come back in a few days. Consult a physician prior to use if pregnant or breastfeeding. If swallowed, get medical help or contact a Poison Control Centre right away. Do not inhale. Keep out of the reach of children.

Medicinal Ingredients/*Ingrédients médicinaux*:

Proper Name / Nom propre	Common Name / Nom usuel	Quantity per Dosage Unit / *Quantité par unité posologique*	Extract / *Extrait*	Potency / *Activité*	Source Material / *Matière d'origine*
1,3,3 - Trimethyl-2-oxabicyclo[2.2.2]octane	Eucalyptol	8.5 %	N/A	N/A	Cinnamomum camphora - Stem Bark Rosmarinus officinalis - whole plant Curcuma longa - leaf
Clay (Sierra)	Clay (Sierra)	5 milligrams	N/A	N/A	
DL-camphor	DL-camphor	3.1 %	N/A	N/A	Cinnamomum camphora - Stem Bark Rosmarinus Officinalis leaf
d-Menthol	d-Menthol	25 %	N/A	N/A	Mentha X piperita - leaf

Canada

CANADA NPN – TOPICAL SPRAY CONT'D



2012/12/07 3:56:23 PM 1/5

Health Canada / Santé Canada

Product Number/*Numéro de produit*: 80038018

Brand Name/*Marque nominative*: SierraSil Pain Relief Topical Spray

This licence is issued by the Minister of Health under the authority of section 7 of the Natural Health Products Regulations. Sale of the described natural health product, including any changes thereto pursuant to section 11 of the Regulations, is subject to the Food and Drugs Act and to the Natural Health Products Regulations.

Cette licence est émise par le ministre de la Santé en vertu de l'article 7 du Règlement sur les produits de santé naturels. La vente du produit de santé naturel décrit dans la présente, y compris toute modification afférente au sens de l'article 11 du Règlement, est assujettie à la Loi sur les aliments et drogues et au Règlement sur les produits de santé naturels.

Issued/émis le: 2012-11-30	Revised/Amended/Modifié le: N/A

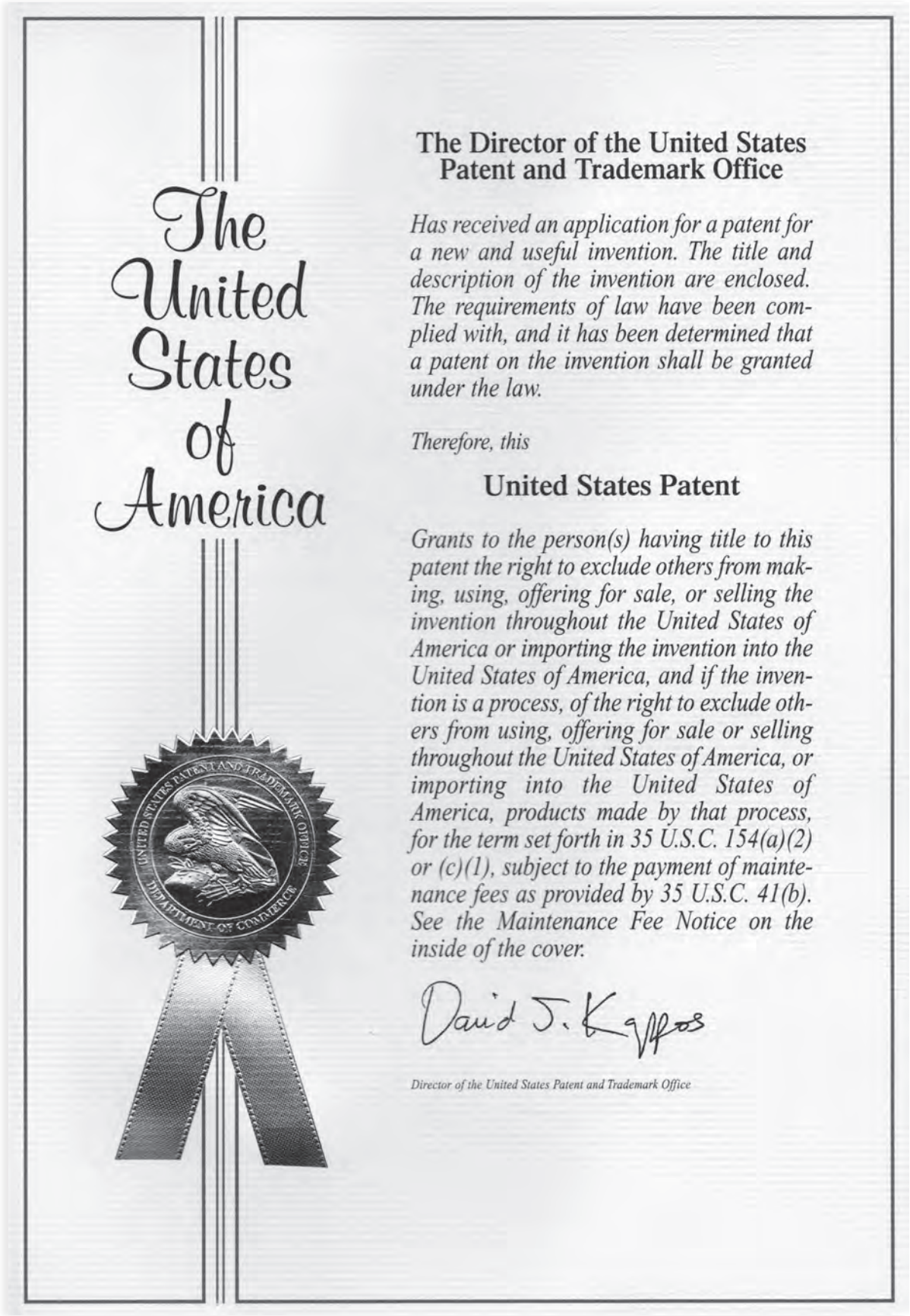
Director General/*Directeur général*
NHPD/*DPSN*

Page 2 of 2

Canada

UNITED STATES PATENT: SIERRASIL® A NUTRITIONAL SUPPLEMENT FOR OSTEOARTHRITIS

7,611,732 / # 7,910,136



The United States of America

The Director of the United States Patent and Trademark Office

Has received an application for a patent for a new and useful invention. The title and description of the invention are enclosed. The requirements of law have been complied with, and it has been determined that a patent on the invention shall be granted under the law.

Therefore, this

United States Patent

Grants to the person(s) having title to this patent the right to exclude others from making, using, offering for sale, or selling the invention throughout the United States of America or importing the invention into the United States of America, and if the invention is a process, of the right to exclude others from using, offering for sale or selling throughout the United States of America, or importing into the United States of America, products made by that process, for the term set forth in 35 U.S.C. 154(a)(2) or (c)(1), subject to the payment of maintenance fees as provided by 35 U.S.C. 41(b). See the Maintenance Fee Notice on the inside of the cover.

David J. Kappos

Director of the United States Patent and Trademark Office

US007910136B2

(12) **United States Patent**
Bentley

(10) **Patent No.: US 7,910,136 B2**
(45) **Date of Patent: *Mar. 22, 2011**

(54) **NUTRITIONAL SUPPLEMENT FOR OSTEOARTHRITIS**

(75) Inventor: **Michael Bentley**, Vancouver (CA)

(73) Assignee: **Sierra Mountain Minerals, Inc.**, Vancouver (CA)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **12/187,994**

(22) Filed: **Aug. 7, 2008**

(65) **Prior Publication Data**

US 2008/0292730 A1 Nov. 27, 2008

Related U.S. Application Data

(63) Continuation of application No. 10/898,215, filed on Jul. 26, 2004.

(51) **Int. Cl.**
A61K 33/12 (2006.01)

(52) **U.S. Cl.** **424/602**; 424/611; 424/682; 424/683; 424/684; 424/724

(58) **Field of Classification Search** ..... None
See application file for complete search history.

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(57) **ABSTRACT**

The present invention relates to a method of treating osteoarthritis by administering a mineral composition in the form of a nutritional supplement, where the mineral composition may contain Smectite, Gypsum, Quartz, Feldspar, Jarosite, Kaolinite and/or Zeolite.

7 Claims, No Drawings

NUTRITIONAL SUPPLEMENT FOR OSTEOARTHRITIS

This application is a continuation of U.S. application Ser. No. 10/898,215, filed on Jul. 26, 2004.

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates generally to a nutritional supplement for the treatment of osteoarthritis. The nutritional supplement includes a purified mineral composition that may be administered to a subject suffering from osteoarthritis. The invention also relates to a method for treating osteoarthritis by administering a mineral composition.

2. Description of Related Art

Osteoarthritis is one of the most widespread forms of degenerative joint and bone diseases. The pathological condition is characterized by localized areas of loss of articular cartilage within the synovial joints, associated with hypertrophy of the bone and thickening of the joint capsule. The exact cause of osteoarthritis is unknown at this time, however the entire process is thought to involve a complex interaction of cells and soluble mediators such as cytokines, growth factors, inflammatory mediators, metalloproteinases, and chondrodegradative enzymes. This complex interaction may further be triggered by physical trauma, surgery, infection, or another disease process. In its more advanced stages, osteoarthritis is characterized by fraying and fibrillation of cartilage resulting from the elaboration of proteolytic and collagenolytic enzymes by the chondrocytes that initially attack the joint matrix. Inflammation of the synovial tissue develops and leads to an increase of cytokines that attack the cartilage. The synovitis also leads to an increase in edema, vascularity and severe pain in the joint.

The disease progression may range from relatively mild symptoms causing pain and swelling to extreme debilitation and physical incapacitation. Complete destruction of the cushioning tissue in the joints may also lead to bone erosion and required joint replacement. Osteoarthritis is a disease that affects all ages, but is more strongly pronounced among people 45 and older. At the present time over 4 million Canadians and 20 million Americans suffer from osteoarthritis; a number that will rapidly increase as the population continues to age. The high prevalence of this disease not only affects the individuals who suffer from it, but also presents increasing costs to the health-care industry and loss of productivity in the workplace.

Treatment regimens for osteoarthritis include exercise and stretching, over-the-counter medications and prescription drugs. Other pharmaceutical treatments have been proposed that directly mediate the cellular/inflammatory cytokine interaction that perpetuates the progression of the disease. While over-the-counter medications and prescription drugs are provided for symptomatic relief they cause a number of side effects that limit their usefulness to those suffering from osteoarthritis. For example, long-term use of high dosage non-steroidal anti-inflammatories such as aspirin, ibuprofen or acetaminophen may lead to upset stomachs, gastrointestinal bleeding and possible liver damage. Stronger prescription drugs such as corticosteroids may lead to brittle bones, cataracts and elevated blood sugar while disease-modifying antirheumatic drugs may suppress the immune system. Additionally, these treatment regimens may be both expensive and difficult to administer in the correct dosages and time intervals.

Nutritional supplements have also been used to bring about positive therapeutic effects in a number of ailments. Proteoglycan-based supplements such as chondroitin and glucosamine have become popular in recent years as sources of joint tissue precursors used to alleviate cartilage destruction cause by osteoarthritis. However, these supplements do not contain the inorganic minerals necessary for the overall treatment of osteoarthritis symptoms. Therefore there is a need for an inexpensive nutritional supplement that provides a composition of minerals for the treatment of osteoarthritis.

The foregoing advantages of the invention are illustrative of those that can be achieved by the present invention and are not intended to be exhaustive or limiting of the possible advantages which can be realized. Thus, these and other advantages of the invention will be apparent from the description herein or can be learned from practicing the invention, both as embodied herein or as modified in view of any variation which may be apparent to those skilled in the art. Accordingly, the present invention resides in the novel methods, arrangements, combinations and improvements herein shown and described.

SUMMARY OF THE INVENTION

In light of the present need for a nutritional supplement and method for treating osteoarthritis, a brief summary of the present invention is presented. Some simplifications and omissions may be made in the following summary, which is intended to highlight and introduce some aspects of the present invention, but not to limit its scope. Detailed descriptions of a preferred exemplary embodiment adequate to allow those of ordinary skill in the art to make and use the invention concepts will follow in later sections.

The present invention relates to a purified composition for the treatment of osteoarthritis. The composition may include Smectite, Gypsum, Quartz, Feldspar, Jarosite, Kaolinite and/or Zeolite. The composition may be administered to a subject suffering from osteoarthritis.

The present invention also relates to a method for the treatment of osteoarthritis. The method may include administering a composition to a subject suffering from osteoarthritis, where the composition contains Smectite, Gypsum, Quartz, Feldspar, Jarosite, Kaolinite and/or Zeolite.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS OF THE INVENTION

The present invention includes a composition and method of treating osteoarthritis. The method may include administering a composition to a subject suffering from osteoarthritis, where the composition contains Smectite, Gypsum. Quartz, Feldspar, Jarosite, Kaolinite and/or Zeolite. This combination of minerals has been shown to have positive effects when ingested by subjects suffering form osteoarthritis. However, each individual mineral may also produce positive effects based on its physical, chemical and therapeutic properties.

Smectite is a hydrous silicate of alumina that is composed of calcium, iron, magnesium and aluminum silicate. Smectite minerals are known for their absorbent and disintoxicating properties. The mineral has been used to treat peptic ulcers by alkanizing stomach acid and bacterial inflammation of the gastrointestinal tract. The crystalline network formed by the minerals composing smectite gives it unique surface conductivity that may lead to its therapeutic effects on inflammatory diseases. This conductivity may also apply to the other silicates found in this composition. Silicates tend to structurally arrange water molecules up to three layers (wetting). In the

presence of molecular water, the silanol groups of small silicates ionize, producing mobile protons that associate/dissociate with the surface to impart an electrical conductivity to the surface that attracts minerals and ions. These layers have been further described as the omega (o—innermost water layer), beta (b—second water layer) and delta (d—outermost water layer). The resulting surface-solution interface that exists at wetted mineral surfaces is called the electrical double layer or zeta potential. It is this characteristic that tends to transport small ions, minerals and electrolytes (i.e. hydrogen, iron, magnesium, calcium, and sodium, etc.). These SiOH groups and the resulting water arrangements tend to cage or sieve minerals. They also hold hydrogen atoms within these structures. When hydrogen is further reduced, a biological antioxidant property is maintained in the silicate mineral particle. Some nutritional investigators speculate that a silica mineral deficiency is involved in the causation of several human disorders including atherosclerosis, osteoarthritis and hypertension, as well as, the aging process

Gypsum is a colorless, white or yellowish mineral composed of $CaSO4{\cdot}2H2O$. It has shown numerous therapeutic effects as a source for calcium. Gypsum may be used to increase hard-tissue healing after injury or surgery by being administered as an oral supplement or directly at the site of injury. Additionally, gypsum has been shown to provide increased water retention and protein stability when used with protein supplements.

Quartz is a very hard mineral composed of silica, $SiO2$, found worldwide in many different types of rocks, including sandstone and granite. Quartz has been used both inside and outside the body throughout history to promote health and well-being. Quartz crystal is thought to radiate or transmit energy in its crystalline structure. When ingested, the silica-based crystal also may have conductivity characteristics shown by the other silicates in the composition.

Feldspar is silicate of alumina that is composed of potassium and aluminum silicate. Silicates have been shown to possess therapeutic conductive and crystalline properties.

Jarosite is an ocher-yellow mineral occurring on minute rhombohedral crystals that is composed of a hydrous sulphate of iron and potassium. Jarosite has been found to form crystalline lattice structures that increase biomass retention.

Kaolinite is a mineral composed of aluminum silicate. It is often used in pelo-therapy in addition with other clay minerals such as those found in the composition of the present invention. Pelo-therapy is the application of thermal muds for recovering from osteoarthritis and traumatic muscle-bone damages. Kaolinite shows high cation exchange capacity creating the opportunity for both functional and durable medicaments. This mineral is also an aluminum silicate and shares many of the same electrical properties as other silicates used in the composition.

Zeolite is a hydrous silicate of alumina that contains sodium, calcium and aluminum silicate. Sodium zeolite has been shown to increase plasma silicon concentrations and alter bone resorption in animals. More specifically, zeolite has been found to inhibit osteoclast-mediated resorption of bone tissue. Other studies have shown that zeolite increases proliferation, differentiation, and transforming growth factor beta production in normal adult human osteoblast-like cells in vitro. Zeolite shares the aluminum silicate group common to several of the minerals in the composition of the present invention which may lead to therapeutic electrical properties and increase water absorption in joint tissue.

The composition has been shown to alleviate the symptoms of osteoarthritis by decreasing cartilage degradation through glucosaminoglycan release as mediated by IL-1β. Additionally, the composition in combination with other additives has been shown to reduce nitric oxide production in connective tissue. Nitric oxide production by inflammatory cells is known to promote tissue damage in chronic inflammation.

In the preferred embodiment of the invention, the composition is a purified mineral composition comprising: Smectite, Gypsum, Quartz, Feldspar, Jarosite, Kaolinite and Zeolite. In a further preferred embodiment of the invention, the composition includes these minerals in the following ratios Smectite 25-75%, Gypsum 0-20%, Quartz 0-20%, Feldspar 0-20%, Jarosite 0-20%, Kaolinite 0-10% and Zeolite 0-10%. In the most preferred embodiment, the composition includes the above-listed minerals in the following ratios: Smectite about 50%, Gypsum about 10%, Quartz about 10%, Feldspar about 10%, Jarosite about 10%, Kaolinite about 5% and Zeolite about 5%. In a preferred embodiment of the invention, the mineral composition is obtained from natural sources such as rivers, streams or other sources of sedimentary rock. However, the composition may be found in any other natural rock source or may be formulated using synthetic means from a variety of mineral sources. In the most preferred embodiment of the invention, the composition is a purified form of sedimentary silt obtained from the Walker River in the Sierra Mountains of Nevada.

The composition may also be processed and purified by a number of procedures before being administered to a subject. In a preferred embodiment of the invention, the composition is screened, crushed and heated before being sold for use. Other cleaning steps may also be used to purify the composition. Additionally, the composition may be further processed into particular types of dosage or delivery vehicles.

The present invention also includes a method of treating osteoarthritis by administering a mineral composition to a subject suffering from osteoarthritis. In a preferred embodiment of the invention, the method includes administering a composition containing Smectite, Gypsum, Quartz, Feldspar, Jarosite, Kaolinite and Zeolite. In a preferred embodiment of the invention, the method includes administering the composition containing the minerals in the following ratios: Smectite 25-75%, Gypsum 0-20%, Quartz 0-20%, Feldspar 0-20%, Jarosite 0-20%, Kaolinite 0-10%, and Zeolite 0-10%. In the most preferred embodiment, the method includes administering a composition containing the above listed minerals in the following ratios: Smectite about 50%, Gypsum about 10%, Quartz about 10%, Feldspar about 10%, Jarosite about 10%, Kaolinite about 5% and Zeolite about 5%. In the preferred embodiment of the invention, the mineral composition is obtained from natural sources such as rivers, streams or other sources of sedimentary rock. However, the composition may be found in any other natural rock source or may be formulated using synthetic means from a variety of mineral sources. In the most preferred embodiment of the invention, the composition is a purified form of sedimentary silt obtained from the Walker River in the Siena Mountains of Nevada.

The method also includes administering the composition to treat inflammatory disease generally. This may include other forms of joint stiffness and joint inflammation that are not directly linked to osteoarthritis. The composition has also shown positive effects in reversing declining bone density, increasing patient energy, improving patient balance and general muscle or joint pain relief.

There are several methods and vehicles for administering the composition to a subject that are within the scope of the method for treating osteoarthritis. These methods include any therapeutically acceptable manner of administering a nutritional supplement or pharmaceutical. In a preferred embodi-

ment of the invention, the mineral composition may be administered as a tablet, capsule, pill, powder, suppository, liquid, drink, intravenous or percutaneous injection, and/or topical cream, gel, ointment, emulsion and/or paste. In these forms, the method of administering the composition may include orally ingesting, injecting, topically applying or administering as a suppository. In a more preferred embodiment of the invention, the method of treating includes administering a tablet, capsule, pill, liquid, powder, or powder mixed with a liquid by oral ingestion.

The composition may also be combined with other additives, inactive or active ingredients to further alleviate the effects of osteoarthritis. Additional active ingredients may include, but are not limited to, pharmaceutical additives such as anti-inflammatories, aspirin, ibuprofen, acetaminophen, naproxen and other additives known for their anti-arthritic or analgesic effects. Other additives may include nutraceutical additives, herbal extracts or other natural ingredients that provide anti-inflammatory, anti-arthritic and analgesic effects. A preferred embodiment of the invention includes a combination of the composition with an herbal extract of *Uncaria guianesis*.

The present method may also include a dosage regimen for administering the above-described composition. The method may include administering the composition on its own or as a supplement to a meal. Additionally, the method may include administering the composition once a day or multiple times a day in order to meet the required dosage. The amount and frequency of the dosage may be further dependent on the physical and health characteristics of the subject. In a preferred embodiment of the invention, the method requires the administration of a single dose to provide the subject with the total required daily amount of mineral composition.

The total dosage amount may also vary according to type and severity of disease. The dosage may also vary depending on the age and health of the subject. A preferred total dosage of the composition is 1.0-100.0 grams per day. The most preferred total dosage is about 2.0 grams per day.

Alternatively, the composition may be directly administered at the site of inflammation or affected tissue through percutaneous injection or transdermal delivery. In a preferred dosage through percutaneous delivery, the composition is extracted through an acid treatment and neutralized before being applied to the inflamed tissue. The preferred dosage through percutaneous delivery may range from 0.001 grams to 10 grams per day.

Although the present invention has been described in detail with particular reference to preferred embodiments thereof, it should be understood that the invention is capable of other different embodiments, and its details are capable of modifications in various obvious respects. As is readily apparent to those skilled in the art, variations and modifications can be affected while remaining within the spirit and scope of the invention. Accordingly, the foregoing disclosure, description, and figures are for illustrative purposes only, and do not in any way limit the invention, which is defined only by the claims.

What is claimed is:

1. A method for treating osteoarthritis, comprising;

administering a composition to a subject suffering from osteoarthritis; said composition consisting essentially of 25-75% Smectite; Gypsum; Quartz; Feldspar; Jarosite; Kaolinite; Zeolite; and optional excipients.

2. The method of claim **1**, wherein the subject is human.

3. The method of claim **1**, wherein the composition is administered in a total daily dosage of about 1.0-100.0 grams per day.

4. The method of claim **3**, wherein the total daily dosage is about 2.0 grams per day.

5. A method for treating osteoarthritis comprising: administering a composition to a subject suffering from osteoarthritis; said composition consisting essentially of 25-75% Smectite; Gypsum; Quartz; Feldspar; Jarosite; Kaolinite; Zeolite; and at least one excipient.

6. The method of claim **1**, wherein the composition comprises purified silt from a river source.

7. A method for treating osteoarthritis comprising:

orally administering a composition to a subject suffering from osteoarthritis; said composition consisting essentially of an effective amount of a mineral composition and optional excipients;

wherein said purified mineral composition consists essentially of:

a. 50% Smectite;
b. 10% Gypsum;
c. 10% Quartz;
d. 10% Feldspar;
e. 10%Jarosite;
f. 5% Kaolinite; and
g. 5% Zeolite.

* * * * *

DIETARY MINERAL ANALYSIS OF SIERRASIL

Dietary Mineral Analysis of Sierrasil

Advanced mineralogical analysis techniques are required to accurately analyze and identify the naturally-occurring blend of silicate minerals in Sierrasil. Conventional analysis techniques are also used to determine the typical elemental composition (see 'Total Content', below). In addition, bioaccessibility testing is conducted to determine the amount of each element which leaves the silicate backbone and becomes available for uptake by the body (see 'Bioaccessible Content', below).

	Total Content		Bioaccessible Content	
Element	**Assay Result**	**Total Content at Recommended Dose**	**Bioaccessible Fraction**	**Bioaccessible Dietary Contribution at 1g/Day**
Calcium	1.6 %	32 mg/day	79 %	13 mg/day
Aluminium*	7.2 %	144 mg/day	4 %	3 mg/day
Magnesium	0.38 %	8 mg/day	22 %	0.8 mg/day
Iron**	3.6 %	71 mg/day	1.3 %	0.4 mg/day
Silicon++	19 %	376 mg/day	0.2 %	0.4 mg/day
Manganese	163 ppm	0.33 mg/day	51 %	0.08 mg/day
Barium^	1,036 ppm	2.1 mg/day	4 %	0.04 mg/day
Nickel	89 ppm	0.178 mg/day	31 %	0.03 mg/day
Copper	22 ppm	0.04 mg/day	25 %	0.006 mg/day
Cobalt^^	6 ppm	0.011 mg/day	78 %	0.004 mg/day
Zinc	58 ppm	0.12 mg/day	8 %	0.004 mg/day
Strontium	495 ppm	1.0 mg/day	0.4 %	0.002 mg/day
Titanium	2,978 ppm	6 mg/day	0.05 %	0.001 mg/day
Selenium	3 ppm	0.006 mg/day	44 %	0.001 mg/day
Vanadium	136 ppm	0.27 mg/day	0.3 %	0.0004 mg/day
Arsenic	3 ppm	0.006 mg/day	6.4 %	0.0002 mg/day
Lithium	1 ppm	0.003 mg/day	10 %	0.0001 mg/day
Lead	9.7 ppm	0.019 mg/day	1.5 %	0.0001 mg/day
Thallium	0.4 ppm	0.00082 mg/day	20 %	0.00008 mg/day
Beryllium	0.3 ppm	0.0006 mg/day	24 %	0.00007 mg/day
Cadmium	0.07 ppm	0.0001 mg/day	58 %	0.00004 mg/day
Uranium	0.3 ppm	0.0006 mg/day	10 %	0.00003 mg/day
Tin	0.3 ppm	0.0005 mg/day	5 %	0.00001 mg/day
Chromium	3 ppm	0.007 mg/day	0.2 %	0.000007 mg/day
Palladium	1.9 ppm	0.0038 mg/day	0.1 %	0.000002 mg/day
Mercury	0.1 ppm	0.00020 mg/day	1 %	0.000001 mg/day
Silver	0.3 ppm	0.0006 mg/day	0.04 %	0.0000001 mg/day
Molybdenum	0.2 ppm	0.0004 mg/day	0 %	0 mg/day
Germanium	0.8 ppm	0 mg/day	0 %	0 mg/day
Niobium	6.2 ppm	0 mg/day	0 %	0 mg/day
Hafnium	3.6 ppm	0 mg/day	0 %	0 mg/day
Tantalum	0.3 ppm	0 mg/day	0 %	0 mg/day
Tungsten	1.36 ppm	0 mg/day	0 %	0 mg/day
Platinum	0.54 ppm	0 mg/day	0 %	0 mg/day
Bismuth	0 ppm	0 mg/day	0 %	0 mg/day
Iridium	0 ppm	0 mg/day	0 %	0 mg/day
Rhenium	0 ppm	0 mg/day	0 %	0 mg/day
Tellurium	0 ppm	0 mg/day	0 %	0 mg/day
Gold	0 ppm	0 mg/day	0 %	0 mg/day
Potassium	0.9 %	17.9 mg/day	No data - this element is added during bioaccessibility testing	
Sodium+	1.0 %	20.9 mg/day	"	
Phosphorous	0.08 %	1.5 mg/day	"	
Boron	13 ppm	0.026 mg/day	"	

Notes

- Recommended daily dose is 2g/day for a 70kg adult.
- The bioaccessible portion represents the amount made accessible to the body during digestion, as determined in testing that simulates the human GI tract.
- The bioavailable portion, being the portion that enters the bloodstream and is available to the tissues, cannot exceed the bioaccessible portion.
- Results presented above are typical values. Actual results may vary with test method/apparatus and product batch, among other factors.
- The above bioaccessibility results were obtained using internationally recognized facilities and procedures, including US Pharmacopeia and BARGE (Bioavailability Research Group Europe) methods.

ARTICLES

Absorptive Minerals – Mechanisms behind Clay's Medicinal Uses

By: Sarah Holvik, B.Sc. Nutritional Science

People and animals alike have used natural earth minerals for numerous medicinal and health-promoting applications throughout history. Minerals in the form of clays and soils have been consumed orally, called geophagy, as well as topically for medicinal and cosmetic purposes. Although at first glance this behavior seems perplexing, science has revealed several possible theories behind this practice. The theory behind geophagy, the deliberate consumption of non-food earth substances such as edible clays, soils and chalk, is multifaceted and relates to health functions such as mineral supplementation, gastrointestinal protective effects and detoxification functions.

MINERAL SUPPLEMENTATION

One explanation for geophagy in animals and humans is to help alleviate nutrient deficiencies in susceptible populations. Clay substances contain essential minerals such as calcium, copper, iron, magnesium and zinc and potassium and phosphorus. The majority of the studies examining the mineral supplementation benefits of clays are based on clays consumed in Africa, most notably by women who purchase mineral-rich clays in markets to prevent nutrient deficiency during pregnancy. Consumed regularly, these clays are thought to function similar to a manufactured mineral supplement in industrialized societies. Another example of geophagy is in China where clay is used as a source of minerals to replace body mineral loss that occurs in early starvation. In addition to the repletion of body mineral content, in this case geophagy also assists in the maintenance of fluid and electrolyte balance (homeostasis), thus preventing body fluid losses and reducing the physical stress of fasting on the body.

DETOXIFICATION AS A FUNCTION OF GEOPHAGY

Detoxification is another commonly accepted explanation of geophagy. Ecological research suggests that the practice of geophagy in animals serves to absorb toxins commonly found in their food supply, such as alkaloids, tannins, oxalates, and other toxic plant constituents. Case studies on certain cultural groups, such as the Pomo Indians of California and natives of Sardinia, further support the detoxification function of geophagic behavior. These native societies use clays in the preparation of certain foods with high toxin levels, for example acorn breads. Acorns are very high in tannins, which are toxic, bitter compounds found throughout nature. In both cultures, clays are used as an ingredient in acorn breads to help bind harmful tannins as well as reduce bitterness. Another case study demonstrating the detoxification function of clay is the traditional consumption of clays with certain bitter and toxic types of potatoes in North and South America to bind toxic glycoalkaloid compounds.

ADSORPTIVE AND ABSORPTIVE PROPERTIES OF CLAYS

The gastroprotective and detoxifying effects of clay minerals are directly related to their highly absorptive and adsorptive properties. This sorptive characteristic of clays is believed to be the basis of the majority of the health benefits associated with geophagy. Absorption is the process by which a substance in one state is incorporated into another substance in another state, for example liquid water being absorbed into ice. Adsorption occurs when ions and molecules bind to the surface of another substance via physical or chemical bonds.

Toxins in the form of minerals (ie. heavy metals), natural organic toxins (such as aflatoxin) or microorganisms such as bacteria, yeast or viruses, are adsorbed and absorbed into the clay mineral matrix as it passes through the digestive tract. By virtue of electrical attraction, positively charged toxins bind to the negatively charged inner and outer surfaces of the clay, and are safely removed from the body along with the clay. A report by the Canadian Journal of Microbiology shows that clay can absorb harmful viruses, aflatoxin, pesticides and herbicides including Paraquat and Roundup. Motmorillonite clay is one of the only types of clays that have both the absorption and adsorption functions. Due to these sorbent properties, clay substances are also effective as gastrointestinal protectors in medicine as they adhere to the gastric and intestinal mucous membrane and protect against invading toxins.

The absorptive properties of clay also allow them to be useful medicinally both as osmotic oral laxatives and antidiarrheal agents. The antidiarrheal effect of clays is attributed to its sorptive behavior, as absorbent minerals in clays are effective in binding and eliminating excess water and gases from the digestive tract. Smectites and kaolinite are the major antidiarrheal minerals due to their high capacity for water absorption. Sodium smectite minerals in clays act by osmosis, drawing water from the blood plasma through the bowel wall to re-establish osmotic balance to produce a laxative effect. The degree of laxative effect is directly related to the sodium content of the clay, which produces an increase in osmotic pressure in the intestine.

The sorbtive properties of clays are not limited to the gastrointestinal tract. Clays are also used in dermatological protective preparations due to their ability to absorb skin secretions such as greases, toxins and bacteria thus eliciting a gentle antiseptic action. The effectiveness of clay preparations on inflammatory conditions such as acne, boils and ulcers due to the sorption of negative inflammatory stimuli is well documented in pharmaceutical and cosmetic preparations.

SIERRASIL® JOINT FORMULA14™

The clinical and anecdotal results with regard to osteoarthritis symptoms experienced by SierraSil® Joint Formula14™ users are mainly attributed to the noted absorptive capacity of clays. Bioaccessibility testing on SierraSil® Joint Formula14™ confirm that only minute quantities of the minerals in SierraSil® Joint Formula14™ are made available by the body for absorption. The remaining minerals pass inertly through the digestive tract in the clay matrix, binding inflammatory toxins during transit and allowing for their safe elimination from the body and elicit a net anti-inflammatory effect. Research is underway to determine further clinical applications for SierraSil® Joint Formula14™ based on historical uses of clays as well as reported anecdotal benefits.

Is SierraSil® Joint Formula14™ a Significant Source of Dietary Minerals?

By: Sarah Holvik, B.Sc. Nutritional Science

SierraSil® is a pure, 100% natural mineral composite containing a wide array of macro and trace minerals in a rich clay structure, used to make SierraSil® Joint Formula14™. The constituent minerals in SierraSil® Joint Formula14™ have been subjected to bioaccessibility testing to determine the quantities available by the body for absorption upon consumption. This testing was performed with the intent of further elucidating the mechanisms of action of the therapeutic effects of SierraSil® Joint Formula14™, as well as to confirm that all levels of constituent minerals fall within regulatory intake limits. The following attempts to clarify the misconceptions regarding the presence of these minerals in SierraSil® Joint Formula14™, and provides contextual information regarding the undesirable mineral constituents and their presence in commonly consumed foods.

ESSENTIAL MINERALS

The essential dietary minerals are divided into two basic categories; macrominerals and microminerals (or trace elements). Macrominerals such as calcium, potassium, sulfur, magnesium, sodium and phosphorus make up approximately 4% of total human body weight, and serve as structural components as well as help regulate osmotic pressure and acid-base balance. The required intake of each of the essential macrominerals is greater than 100 milligrams per day, and can range up to grams per day (ie. calcium), whereas trace elements are required in amounts less than 100 milligrams per day, often much less (ie. microgram amounts). Trace elements are essential components of metabolic constituents such as enzymes, hormones, vitamins and biological catalysts. Deficiency in any one of the essential minerals can lead to serious health consequences, including death. However, some of these minerals are toxic at higher concentrations and have prompted the development of tolerable upper intake levels for minerals.

SierraSil® Joint Formula14™ contains a wide array of minerals essential to health as well as some which have known toxicity issues. When examining the mineral content of SierraSil® Joint Formula14™, it is important to consider that only minute quantities of each constituent mineral are actually released into the body upon ingestion, as shown by repeated bioaccessibility testing. These quantities of minerals are insignificant in relation to both the required intake levels of the essential minerals in SierraSil® Joint Formula14™, as well as regulatory limits for minerals with toxicity issues. Thus, although it contains a wide spectrum of essential minerals, SierraSil® Joint Formula14™ can not be considered a significant source of dietary minerals as the majority of the minerals in SierraSil® Joint Formula14™ remain in the clay matrix and pass through the body unabsorbed. This analysis also suggests that the mineral content of SierraSil® Joint Formula14™ does not contribute greatly to the overall therapeutic effects, and instead the minerals work synergistically together with the clay component of SierraSil® Joint Formula14™ to elicit the observed therapeutic effects.

UNDESIRABLE MINERALS

Although SierraSil® Joint Formula14™ contains some potentially undesirable minerals, it is important to understand that these minerals exist in similar or higher levels in the environment and common foods. Bioaccessibility testing confirms that the quantities of these minerals in SierraSil® Joint Formula14™ are insignificant and fall far below established toxicity limits. Some examples of potentially harmful minerals contained within SierraSil® Joint Formula14™ include aluminum as well as heavy metal contaminants arsenic, lead, mercury and cadmium. To put some perspective on the amounts of these detrimental minerals in SierraSil® Joint Formula14™, consider the following examples of these minerals in commonly consumed foods.

Aluminum is a ubiquitous element that is found in abundance in the environment as well as many food products such as grain products, milk, yogurt and cheeses as well as processed foods. An average daily dosage of SierraSil® Joint Formula14™ provides 6 mg aluminum that is available for absorption by the body, which falls far below the regulatory upper tolerable intake limit of 70 mg per day. In contrast, a single slice of individually wrapped processed cheese can contain up to 50 mg aluminum, and a slice of cake or bread made with baking powder may contain 5–15 mg aluminum. The health concerns with aluminum mostly spring from its association with the formation of plaques in patients with Alzheimer's disease, as well as its health risks in people with impaired kidney function. To date, no causative link between aluminum and Alzheimer's has been found.

Dietary arsenic represents the major source of arsenic exposure for the general population. Arsenic exists in many forms with varying reactivity in our environment. Pentavalent and trivalent inorganic arsenic react with biological compounds in the body, and can result in enzyme inactivation, structural damage and disruption of DNA synthesis. In contrast, organic arsenic compounds are considered to be less toxic or nontoxic compared to their inorganic counterparts. Organic arsenic compounds are commonly found in fish at levels between 1 and 10 mg/kg, and in higher levels in seafoods (at or above 100 mg/kg). Despite the seemingly high quantity of arsenic found in these foods, there have been no reports of ill effects among ethnic populations consuming large quantities of organic arsenic containing fish. The bioaccessible arsenic content of an average daily dosage of SierraSil® Joint Formula14™, 0.0007 mg/day, falls far below the amount commonly found in fish and seafood as well as the established upper intake limit of 0.15 mg/day, and thus not be considered a safety concern with SierraSil® Joint Formula14™.

Crude mineral analysis shows that SierraSil® Joint Formula14™ also contains minute quantities of other potentially undesirable minerals- these include mercury, cadmium and lead. However, as with arsenic, bioaccessibility testing shows that these minerals are also present in much lower quantities in SierraSil® Joint Formula14™ than many commonly consumed foods and thus do not present safety concerns.

Like arsenic, mercury is also found in fish and shellfish largely in the form of methylmercury, which is recognized as more toxic than inorganic mercury. Mercury targets the nervous system, particularly the developing brain as methylmercury is able to pass through the

placenta about 10 times more readily than other mercury compounds. The concentration of methylmercury in most fish is less than 0.4 mg/kg, however predatory species such as swordfish and shark may contain up to several mg/kg. The average daily intake of methylmercury ranges from 0.2 to 3–4 mcg/kg body weight/day, which is dependant on fish and seafood intake. In contrast, bioaccessible mercury in SierraSil® Joint Formula14™ is present in nil amounts in an average daily dosage, well below the upper intake limit of 0.05 mg/day, and thus also does not represent a safety risk.

Diet and drinking water are the main routes of human exposure to cadmium and lead. The highest concentration of cadmium in foods are found in mollusks, kidney, liver, cereals, cocoa and leafy vegetables. In addition to foods and drinking water, lead-containing manufactured products and air contamination also contribute significantly to lead intake. Infants and children are at the highest risk of lead exposure as they absorb lead from the diet with greater efficiency than adults. As with other potentially undesirable minerals in SierraSil® Joint Formula14™, cadmium and lead levels in SierraSil® Joint Formula14™ do not reach significance as their concentrations are over 100-fold below established upper intake limits.

MORE THAN ITS MINERAL COMPONENTS

From this data, it is apparent that the bioaccessible amounts of both the health-promoting and potentially toxic minerals in SierraSil® Joint Formula14™ are very low based on tolerable upper intake limits and levels commonly found in foods and the environment, and thus do not represent safety concerns. Compounded with the numerous other toxicity studies showing SierraSil® Joint Formula14™ to be non-toxic and safe for human consumption under the recommended conditions of use, the information here serves to provide further support to the safety of SierraSil® Joint Formula14™ as a natural joint health product.

REFERENCES

Article 1. Absorptive Minerals – Mechanisms behind Clay's Medicinal Uses

1. *Aufreiter, S; Hancock, RGV; Mahaney, WC; Stambolic-Robb, A; Sanmugadas, K. Geochemistry and mineralogy of soils eaten by humans. International Journal of Food Science and Nutrition. 1997; 48:293–305*

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3. *Johns, T; Duquette, M. Detoxification and mineral supplementation as functions of geophagy. American Journal of Clinical Nutrition; 1991, Vol/Issue: 53:2, 448-56*

4. *Phillips TD et al. Reducing human exposure to*

Article 2. Is SierraSil® Joint Formula14™ a Significant Source of Dietary Minerals?

1. *Szefer P, Nriagu J. Mineral Components in Foods. CRC Press, Boca Raton, Florida, 2007*

2. *Bioaccessibility tests performed by Cantox Health Sciences International.*

TESTIMONIALS

Health Practitioners

All testimonials are signed and authorized. In some cases the provider of the testimonials received a complimentary bottle of SierraSil® Joint Formula14™ in appreciation of their statement. Please visit our website or our Facebook page for additional testimonials. Additionally, video testimonials may be found on Youtube by searching 'SierraSil'.

DR. MICHAEL MEDGESSY, DC | MEDINA, OH: After exertion whether work or exercise I would have stiffness and soreness, but with SierraSil I didn't have any symptoms! Also I would need less glucosamine sulphate.

DR. JOHN DIAMOND, MD | RENO, NV: I conducted a review of SierraSil® and then assessed results on a first hand basis with patients. The results included substantial relief of arthritic symptoms and general improved mobility in approximately 26 of the 28 patients with no negative responses or poor tolerance in the other 2. Consequently, I have decided to make SierraSil a recommended product. The results continue to reflect what I observed in my first review, namely a high rate of efficacy, typically within two weeks allowing patients to achieve comfort, flexibility and/or mobility that in some cases they haven't enjoyed for years.

DR. DELFORD ROTH, MD | SCOTTSBLUFF, NE: I read the book on SierraSil and wanted to try it. I gave a bottle to a 79 year old male patient who agreed to let me know in 3 weeks how he felt. His daily routine always included 4 doses of ibuprofen and 3 doses of acetaminophen in between doses. In 3 weeks he advised me to get another supply. He no longer uses ibuprofen or acetaminophen, had no pain and had more energy. Now many grateful patients come to my office asking for it.

DR. GEORGE W. LUCAS, MD | MARIETTA, GA: I have had chronic osteoarthritis since 1992, being worst in lumbo-sacral spine and sacro-iliac joints. The severity of pain required injections of corticosteroids and finally radiofrequency ablation of L-S nerves. On SierraSil after 14 days I was dramatically improved. In one month (now) I have minimal pain.

DR. PETER SHARKY, MD | JEFFERSON MEDICAL COLLEGE, PHILADELPHIA, PA: I've been recommending SierraSil and I've seen some excellent results. My patients have reported less pain and restored mobility. I've found that SierraSil is one of the best options available. Seldom have we found an ingredient as effective as SierraSil in treating arthritic conditions.

DR. BAL PAWA, MD | VANCOUVER, BC: SierraSil has been effective in reducing and in some cases eliminating symptoms of joint/muscle aches and pains. Due to its high safety index, we can confidently recommend this product as a stand alone for suitable patients or as an adjunct to other treatments.

DR. ROD THOMPSON, DC | WINNIPEG, MB: I began using SierraSil personally to see if it would help with knee pains resulting from old injuries. Before using SierraSil I was unable to run for more than fifty yards because of pain in both knees. After using SierraSil for about two months I was able to run as far as my 60-year-old heart would take me (about 5K) with absolutely NO knee pain whatsoever! I began recommending SierraSil to my patients and the results have been impressive. There are very few people who either cannot take SierraSil or do not notice any benefit, but the vast majority, approximately 90%, find it very helpful for various

inflammatory conditions. The demand has become so great I have trouble keeping it in stock. I recommend it without reservation.

DR. CHARLES RASSEL, DC | ESCONDIDO CA: As a chiropractor and nutrition specialist, I know the damaging effects of an inflammatory lifestyle, and have seen first hand in my clinic how SierraSil's natural anti-inflammatory mineral compound effectively treats joint pain. The results are incredible!

DR. NATHAN STROHM, DC | AUBURN, WA: All of my patients have had nothing but good things to say about SierraSil. My office manager has told me that she can feel the difference when she is not taking it and that she was excited to get more.

Professional Athletes

MICHAEL MORRIS, OLYMPIC TRAINER FOR PROFESSIONAL BOBSLEDDER/SKELETON AND INDOOR FOOTBALL | OCEAN CITY, NJ: I have a ton of gratitude for the SierraSil Powder and Topical Spray. I am amazed by the amount of overall joint improvement in only 3 weeks. I can't wait to see what happens in 3 months of supplementation. The spray is an awesome pain reliever and I enjoy the aroma. My training has had marked improvement, the lower gastrol/Achilles issue has been almost completely negated.

MARTY REASONER, RETIRED, NHL: Back in 2003 I went through 2 knee surgeries. I needed to take every advantage I could to return to NHL and compete at that level. Through hard work during the off-season and the help of SierraSil I did not miss a game in 2 years. I recover much faster between games and my knee does not ache as it used to. I completely recommend this product. SierraSil makes a difference, no question about it.

DAMON ALLEN, 2005 CFL M.V.P AND M.V.P OF THE 2004 GREY CUP | TORONTO, ON:
In 2007 I received a product called SierraSil Joint Formula and a Topical Spray for Pain Relief. The game of football is a violent sport and there are times when sore muscles, aches and pains come from playing a hard fought game. I have been playing in the CFL for 23 years as Quarterback, so I know about aches and pains. When I turned 40, after games it would take me much longer to recover from a game than in the past. So I started taking SierraSil and after about a week, I noticed from workouts, practicing and games that my soreness and aches and even at times my back pain was subsiding. I started telling my teammates and they started taking the product out of my locker, they really liked the topical spray. So what am I telling you? The product is great!! I'm 44 years old, in my off season still taking SierraSil, I'm training and my body feels great. (Mr. Allen subsequently retired from professional football).

ANTHONY TOTH, PROFESSIONAL TRIATHLETE | VANCOUVER, BC: I'm a professional Triathlete and 5 seconds can make a world of difference in a race, yet alone 5 seconds every 100 meters. Since trying Informed-Choice sport certified SierraSil Joint Formula14™, I have been able to train harder and get quicker. It's the reduced recovery time that I feel most.

JOE BOOTH, SNOWBOARDER | BOZEMAN, MT: As a professional Snowboard and Kayak instructor I put an enormous strain on my joints. After only a few days of taking SierraSil I noticed a wider range of motion without any joint pain as well as more energy to ride the hill or stay on the water longer.

JEFF HANDLER, PERSONAL TRAINER | BOSTON MA: I work with over 100 athletes and have many clients using SierraSil and we find it to be the best product we have used. The results have been amazing.

CHERYL BERNARD, 2010 OLYMPIC SILVER MEDALIST IN CURLING | CALGARY AB: I was self medicating with Ibuprofen for a knee injury that I had from too much training when I discovered SierraSil. My doctor said that the cartilage and my IT band above and below the knee where inflamed from too much exercise, and even seeing him 6 times a week wasn't getting rid of the problem. Within a month of using SierraSil I noticed a difference with my knee and was able to return to my full workout schedule. I also love the spray and use it every time on my knee and calf before I curl, and in the last tournament every time before I threw!

JULIA MURRAY, OLYMPIC SKIER | WHISTLER, BC: Since the 2010 Olympics, I have had two ACL reconstructions and a micro fracture surgery on one knee to fix the cartilage damage (2 cm 2 bare bone). I continue to ski, bike and run, but my knee swells and aches. SierraSil keeps my swelling down, helps my aching and supports my active lifestyle. As a holistic nutritionist, I love the fact that the ingredients are natural!

MARK FAYNE, EDMONTON OILERS, NHL: I used SierraSil throughout my first NHL season with the N.J Devils in 2010 and 2011. SierraSil made a huge difference in everything from my recovery to joint stiffness and soreness. SierraSil is an amazing product!

KEVIN O'CONNOR, MASTERS ELITE RUNNER: As a 44 year old serious running athlete, I find SierraSil Joint Formula and pain relief spray enables my recovery from the same hard workouts that I ran 17 years ago when I was at my peak. I can still do the same workouts today as I was doing at 29 but what I needed was to recover better and quicker. Since taking Sierrasil products this has assisted greatly in my training with confidence after hard workouts and now I'm running almost as well as I was in 1994 and 1996.

DALE WEISE, MONTREAL CANADIENS, NHL: I started using SierraSil over the summer and almost right away I noticed a difference in my recovery from workouts.

TOMMY EUROPE, CELEBRITY PERSONAL TRAINER, FORMAL PROFESSIONAL FOOTBALL PLAYER: I used SierraSil to help with an old shoulder injury from football and continue to take it daily as it's the best product I've found for recovery and eliminating post exercise stiffness.

BILL REICHELT, HEAD ATHLETIC TRAINER, BC LIONS, CFL: Our players are our most important asset, and keeping them in game shape in my priority. SierraSil Joint Formula14™ and Topical Spray help players perform their best.

JOSEPH CANNON, GOALTENDER, RETIRED MLS PLAYER | VANCOUVER, BC: I decided to try SierraSil as an effort to help my joints and muscles cope with the rigorous training. I just want to say thank you for such a great product and for keeping me out of the cold baths! I feel stronger now than in years past. Not only am I way ahead of where I was a year ago, but also much more prepared for this upcoming season. I recommend to any athlete looking for an edge to try SierraSil. I hope you find the results as beneficial as I do.

Consumers

ERIN DAVIS, 98.1 CHFI | TORONTO: Staying in shape isn't as easy as it used to be. SierraSil frees me from the aches and stiffness so I can feel great.

BETTY BERKLEY | CARROLLTON, OH: This day calls for a special celebration of thanksgiving and relief from pain. 2 weeks ago I arrived in Canada in a wheelchair, so affected with arthritis and stenosis that every move was a concentrated effort. Fatigue was a constant presence. My daughter-in-law who works at Health Food Heaven in Squamish BC is very knowledgeable and her choice of treatment for me was SierraSil. After only a few days on these capsules, the improvement was amazing. I can move about without a walker, wheelchair or cane. I have much more energy and endurance and sleep at night is the best in years. When I leave Canada it will be with an ample supply of SierraSil in my bags. In returning home to Ohio, I hope to introduce my doctor to this miraculous product that may benefit others with similar conditions and I indeed, may be able to fulfill my Doctor's hope to be her first centurion patient, with the help of SierraSil.

BRIAN FLETCHER | DUNCAN, B.C: I have been taking SierraSil now for 1 month after hearing about it on the Shell Busey radio program. I have had bad knees for years, owing it to Gout. My doctor recommended that I should have knee replacements but after taking SierraSil I have decided not to, as I do not have any pain whatsoever. I take 3 capsules everyday and they work just great for me.

IRENE MCMILLIAN | WINDSOR, ON: After suffering from Rheumatoid Arthritis and Osteoarthritis for 19 years, I was introduced to SierraSil Joint Formula14™. After 4–5 days I no longer needed my cane to get me started in the morning. As for my walker, it is also collecting dust. I can go shopping for 2–3 hours and stand for long periods of time, something I could not do before using SierraSil.

AUDREY PURCHASE | GIROUX, MANITOBA: Hi, wanted to let you know before I started SierraSil I inquired with my doctor. He told me it would take 3-4 months to help. I am suffering from fibromyalgia and arthritis which affects the muscle and joint. After 2 and half months, I could hold my neck with no pressure; I take three capsules daily and will continue, they are "helping a lot". No one can expect miracles over night. Thanks again for giving me relief.

GENEVIEVE LEIS | PUEBLO, TX: I am 80 years old, and I am so delighted with SierraSil. In a very short time it has done more to eliminate the toxins and inflammation in my stiff out-of-alignment spine and helped my overall flexibility and ligaments more than my other supplements and therapies in 30 years. And I am gaining strength and hopefully this is going to save me from having to go to a nursing home.

RICHARD MARTIN | TORONTO, ON: I am a retired business owner of 64 yrs of age and I have been doing triathlons for about 20 years. A friend recommended SierraSil in April of 2008, as I mentioned that my knees were shot and I may have to give up running altogether. After 2–3 weeks of use I could feel that my usual pain in my knees wasn't as bad as before, and after 2–3 months I ran pain free for the first time in years. I can now get up in the morning pain free even after a 2 hour run and a 4 hour bike ride the day before. I have recommended your product to at least a dozen friends, and have nothing but glowing reports back. It's wonderful!

DARRYL PENNY | ALTAMONT, MB: 3 years ago I was having great difficulty walking due to pain. I took stairs sideways 1 at a time. My partner told me about SierraSil and suggested I try it. I thought oh yeah spend money on some junk pill. I agreed to try it for 2 months. 4–6 weeks into taking these I ran down stairs and back up again. I didn't believe my partner when she told me what I had just done. I have been faithfully taking it since and can still outrun my children as well as my neighbor's children. Nice to be able to work all day and not be stiff or sore. Thank you SierraSil.

CHUCK RALLISON | RIMBEY, AB: I play senior men's softball in Alberta and each fall I also play in Utah, USA. My knees were a major deterrent to running. I started taking SierraSil about 6 months ago and have much less discomfort while playing ball and the next day. I also notice less trouble with my Crohn's condition.

FRANK KELLY | VANCOUVER, BC: Some years ago I began to experience throbbing pain in my right knee, my doctor diagnosed Osteoarthritis. I endured the painful condition for approximately 1 year. Then I discovered SierraSil and my condition improved within 2 weeks. The only change in my lifestyle has been a small increase in my intake of Vitamin D and I think more significantly my daily dosage of SierraSil. I have no hesitation (and have done so) in recommending SierraSil to all my acquaintances who complain of joint pain or stiffness.

DEB SMITH | KINDERSLEY, SK: I heard about SierraSil through a friend from B.C. when I was battling chronic pain from a herniated disc in my back. Within weeks of taking SierraSil daily the pain almost disappeared – I could hardly believe the instant relief I got. I tried everything from meds to chiropractors to physio to a cortisone injection and nothing worked until SierraSil!

REID STEKEL | NORTH YORK, ON: Following my back surgery a couple of years ago, my wife read an article about SierraSil. Being a natural mineral, I decided that no harm could be done so I tried it. Within a month, pain levels decreased (so did my intake of prescription meds) and I was waking up with dramatically less stiffness. After running out of SierraSil, I decided to see what would happen to me if I didn't take it. Within a week I was miserable! I have been happily popping my 3 capsules ever since. Thank you SierraSil!

GORD MUDIE | HANNON, ON: After suffering severe constant pain in my hands, biceps and shoulders due to a carpal tunnel syndrome since Nov-09, my wife heard about SierraSil and picked up a bottle plus the spray. I tried another advertised meds plus medical visits which did nothing. After 3 weeks the pain in shoulders, biceps and arms was gone and the hands are 80% better. Thanks to SierraSil!

KATHY BURTON | SURREY, BC: I just wanted to share how happy I am with SierraSil for my knee. My knee was so stiff I could barely walk up and down stairs. I had to stop walking my daily 1km walk as there were too many hills, I could manage only flat areas. After taking SierraSil for 4 days I noticed an improvement. I have been taking SierraSil for 4 months. I have had a great summer, walking anywhere and cycling for up to 40km trips. I have recommended this product to many others and they have the same amazing results!

ARDELL PAUL | LONDON, ON: Marvelous product! I've had fibromyalgia for 20 years and muscle pain is greatly reduced. Arthritic joints are much more flexible.

DOUG AND JOCELYN CORBETT | WINFIELD, BC: It is with pleasure that my wife and I would like to add our names to the list of satisfied customers of SierraSil Joint Formula14™. We have found great relief to knee and leg pains, after using for a short period.

ERNIE WALL | LAC DU BONNET: I had replacement hip surgery 3 1/2 years ago and the Dr. said I would need my knee done as well. I started SierraSil and now don't need the knee surgery at this time.

JIM DOAN | KAMLOOPS, BC: I have been teaching karate for almost 30 years and I have had chronic hip pain for even longer before using SierraSil. I would not be able to walk or drive long distances without developing a painful limp. It has now been 10 months without a limp. This includes a six hour flight to Hawaii and plenty of walking once we arrived. I never hesitate to recommend SierraSil to my students – I am convinced!

LEESA NACHT | STOUFFVILLE, ON: Over the last year it felt like every workout made me ache more and more. At 54, I thought being fit should make me feel better not worse. Today is only day 11 on SierraSil and I can't believe the change. No more aches and pains! I am even sleeping better and wake up without any stiffness! Thank you for improving my quality of life.

LORRAINE SAUVE | ST. GEORGES, MB: Clark, our 6 year old dog, was having problems with his hips and left hind leg. He walked on 3 legs & used the other for balance. When lying down he struggled to get up. I decided to give him SierraSil. He received one daily & one aspirin; it helped. While checking on-line it said 1 capsule for 44lbs of dog. He now gets 2 capsules & no aspirin. He's happy and extremely active, thank you SierraSil.

MERLE HILL/WINNIPEG, MB: After 3 days of taking SierraSil I was free of pain in my knees and back and still free of pain – great product – and gave me back lots of energy. Thank you!

THE UNIVERSITY OF BRITISH COLUMBIA

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May 14, 2016

Michael Bentley
SierraSil Health Inc
530 – 1501 W Broadway,
Vancouver, BC, V6J 4Z6

Dear Michael,

Thank you for your input on the Mary Pack Arthritis Program (MPAP) Provincial Arthritis Strategy. There are about 700,000 British Columbians with osteoarthritis and 100,000 with rheumatoid arthritis and other inflammatory arthritides. These numbers are expected to grow significantly over the next twenty years. Our objective at the MPAP is to better serve this growing population using existing resources. I strongly believe that, using a provincial technology platform, earlier intervention including education healthy diet, exercise, weight management and life style, including sleep, will reduce the impact of osteoarthritis and rheumatoid arthritis. In addition, natural health products may play a helpful role in improved patient outcomes and reduced costs.

About two years ago, after discussion with other physicians, I investigated the research on the SierraSil® minerals. Subsequently I recommended them to some of my patients with mild to moderate OA and/or RA. It is my observational experience, that the minerals have been helpful in the majority of patients. Many of these patients have felt less pain and have been more able to resume exercise or enhance their mobility or other activity, improving outcomes and well-being. I note that the onset of such results has typically been within one or two weeks surpassing my expectations. As these are just my observational findings, may I encourage SierraSil Health to continue its research including: Additional mechanism of action investigation; assessing potential medication interactions if dosage is not separated from such medication; and conducting additional clinical studies as resources permit.

Again, thank you for your helpful input to the MPAP, and continued good wishes with your Company mission to help people be healthier and more active.

Sincerely,

Kam Shojania, MD, FRCPC
Clinical Professor and Head, Division of Rheumatology,
University of British Columbia
Medical Director, Mary Pack Arthritis Program

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